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ELEMENTS  
OF  
*NATURAL HISTORY;*

BEING  
AN INTRODUCTION TO THE  
*SYSTEMA NATURÆ OF LINNÆUS;*

COMPRISING  
THE CHARACTERS  
OF THE WHOLE *GENERA*,  
AND MOST REMARKABLE *SPECIES*;  
PARTICULARLY OF ALL THOSE THAT ARE NATIVES OF  
*BRITAIN*,  
WITH THE PRINCIPAL CIRCUMSTANCES OF THEIR  
HISTORY AND MANNERS.

LIKEWISE  
*An alphabetical arrangement, with definitions,  
of technical terms :*

IN TWO VOLUMES ;  
*With twelve explanatory Copper-plates.*

VOL. II.

CONTAINING THE FIFTH AND SIXTH CLASSES,  
*viz.*

V. *INSECTS.* and VI. *VERMES.*

---

*Turpe est in patria vivere et patriam ignorare.*

*Qui autem ad observandum appolit animum, ei etiam, in rebus quæ vulgares  
videntur, multa observatu digna occurrunt.*

*Esch.*

---

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## ADVERTISEMENT.

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THIS Work being now completed, the Editor must apologise for not having intitled it *Elements of the Natural History of the Animal Kingdom*. He originally intended to have included Botany and Mineralogy in his plan ; but, the English Reader, has already so many excellent helps to the study of the former branch, that every other attempt on that subject is manifestly superfluous. With regard to the Mineralogical System of Linnæus, he says himself that he did not boast of it ; and, Mineralogy in the present day, has assumed a new aspect ; it is therefore judged proper to renounce, for the present at least, any introduction to that science, till some System shall appear which may be generally adopted.

In prosecuting the subject of the present Volume, it appeared at first sight necessary, in a translation, to give English names to the Genera and Species ; but, as those subjects have hitherto been comparatively little studied in this country, it is not surprising that our language should be inadequate to the purpose. The generally received names are inserted, but they are few : In the genus *Papilio*, the names of the English Collectors are used ; and, in that of *Sertularia*, no person will probably venture to change those of Mr Ellis : to the rest, the Editor has not presumed to give any ; ere long, no doubt, they will be imposed by some English Naturalist of eminence and authority.

With regard to the terms, the mere English reader will be at no loss to find the corresponding Latin word in the Glossary.

A number of Latin terms are sometimes retained when these are either in a manner naturalized in English, such as *Rostrum*, *Proboscis*, or more determinate, such as *Apex*, a point ; the word *Punctum* having the same English denomination. *Antennæ*, *Palpi*, *Elytra*, &c. are used, as being easily learnt, and by no means of difficult pronunciation. *Sessile* is as intelligible as *Sitting*, and either must have been explained. Other latinized terms will be found, perhaps more offensive at first, to an English ear, such as *porrected*, *turrited*, &c. but custom will soon reconcile the student to the use of them.

The Editor has endeavoured to give as complete a list of the natives of Britain as his reading, and his view of different collections, could supply. At a distance from the rich cabinets of London, he is sensible that, in this respect, his attempt is still very imperfect : but a complete enumeration of species must be a work of time, and the labour of many individuals ; and he hopes the present Volumes, by facilitating the study of Natural History, will induce many to assist in investigating the productions of their native country.

In the Infusory animals, he has given but one species of each genus : to have described all that are natives of England, would have required a separate Volume.

A few errors have been committed in the printing, some of which, as they affect the sense, it is requested may be corrected with the pen.

**QF**

**O F**

§ 222.

**§ 223.**

Vol. II

A

**which**

\* From ἴππεον an insect, and λόγος a discourse.

which is soft, succulent and barren ; it is employed intirely in feeding, and two or three times changes its skin as it grows.\*

When the larva has attained its full growth, it changes into a *Chrysalis* or *Pupa*, which hardly encreases in size, and is still barren.

In this state Insects appear under five different forms, viz.

1. *Pupa completa*. When the Larva and Pupa are capable of motion, when they take food and very much resemble the perfect insect, as in Spiders, Crabs, &c.
2. *Pupa semi-completa*. When the Pupa moves, eats, and has wing-cales ; the Larvæ of these have six feet ; as in Grass-hoppers, Bugs, Dragon-flies, &c.
3. *Pupa incompleta*. With motionless feet and wings ; the Larvæ have sometimes six, sometimes more feet, sometimes none at all, and their motions are slow ; as many Beetles, Bees and Ants.
4. *Pupa obtecta*. With a coriaceous skin, so that the thorax and abdomen with the other members can be distinguished, as in Butterflies.
5. *Pupa coarctata*. Of an oblong cylindrical shape, with no part of the body visible.

The three last species of Pupa, are often inclosed in a particular envelop which the larva prepares before it suffers its change. Some, by means of a viscous juice connect together a number of extraneous bodies, and thus construct a firm habitation, as the larvæ of Beetles, the Myrmeleon, &c. Others, particularly those of the Phalanxæ, by means of a viscid juice, secreted in certain vessels, and prepared by an organ fitted for the purpose, spin a web in which their oblong Pupa repofes. Others, as the larvæ of the Tenthredos, encircle themselves with a capacious network. Some larvæ are fed by the old insects in particular cells, which are shut when the animal enters into the pupa state, as in Bees and Wasps. The pupæ or chrysalids of Butterflies are sometimes attached to walls by the hinder extremity of the body, and sometimes they tie themselves by winding a thread round their

\* For a classification of Larvæ by the celebrated Bergmann, see *Insecto-Theology*, p. 339.



their thorax, the ends of which are fastened to the support, as the *Papilio Machaon* and *Podalirius*.

To undergo this change, some larvæ wrap themselves up in leaves; others seek for holes in walls, or the hollows of trees; others go under the earth and remain there.

## § 224.

Having remained in the Pupa state a longer or shorter time, and having in a most wonderful manner, attained all its parts, its utmost size, and put on a very different appearance, the perfect insect bursts its prison. It is now called the *Imago, insectum declaratum, perfectum*. For the most part the perfect insect eats nothing, or merely sucks the juices of flowers or the blood of animals, as Butterflies, and some of the *Diptera*; but there are some which not only eat, but actually grow larger, such are the *Silphæ*, the *Curculiones*, &c.

## § 225.

The body of insects is divided into the head, the thorax, the abdomen, and the limbs, (*artus*.)

The body is hemispherical (*semiglobosum*;) in the *Coccinella*; oval in the *Chrysomela*; oblong in the *Tenebrio*; cylindrical in the *Julus*; long and slender (*lineare*;) as in some of the *Cimices*.

## § 226.

The head is connected with the thorax by a very slender neck. In most insects it is separated from the thorax (*distinctum*) and moveable. In some it forms one piece with the thorax, and is immoveable, (*connatum, coalitum*), as in the *Aranea*, *Scorpio*, *Cancer*, &c. In some, as the *Curculio*, *Panorpa*, it grows narrow towards the point, (*antice angustatum*); in others it is narrowest behind, (*postice angustatum*), as in the *Raphidia*, *Attelabus*. It is sometimes rough with eminences, (*tuberculatum*), as in many *Scarabæi*; *cornutum*, with horns; or wanting them, (*muticum*), as in some *Scarabæi*; in some it stands out, (*exsertum, prominens*), as in the *Tenebrio*; in others it hangs down (*nutans, inflexum*), as in the *Meloe*; in others it can be drawn in within the thorax, (*retractile*), as in the *Ptinus*, *Dermestes lardarius*, &c. in others it

is covered with a shield (*clypeatum*) as in the *Cassida* and some *Scarabæi*.

§ 227

The head consists of the mouth, the eyes, the ocelli or stemmata, the antennæ and the forehead (*frons*.)

The parts of the mouth are the foundation of the classes and orders in the system of Fabricius, who has more accurately described them, than any other entomologist. According to him they consist of the following distinct parts.

1. The *Clypeus*, which covers the mouth above, (Plate VIII. fig. 1.)
2. The *Labia*, which close the mouth below, that the food may not fall out of it, (Plate VIII. fig. 2.)
3. *Mandibulæ*, which move transversely; they are of a horny substance, situated immediately under the clypeus, and shut the sides of the mouth above, (Plate VIII. fig. D.)
4. The *Maxillæ*, which likewise move transversely; they are often membranous, and shut the sides of the mouth below, (Plate VIII. fig. E.)
5. The *Galea*; this is cylindrical, obtuse, and covers the maxillæ, (Plate VIII. fig. 3, A a.)
6. The *Palpi*; these are moveable, articulated bodies, sometimes two, generally four, and seldom six; they are probably organs of some sense; they assist the insect in eating, (Plate VIII. fig. 3, A c c c.)
7. The *Lingua spiralis*; the spiral tongue, which lies rolled up between the palpi, in butterflies. (Plate VIII. fig. 4. a.)
8. The *Rostrum*, contains in a flexible vagina one or more bristles; as in the *Cimices*, *Chermises*, &c. in which last it opens by the thorax, (Plate VIII. fig. 5. a.)
9. The *Proboscis*; divides at the point into two lips, and can be drawn in, (Plate VIII. fig. 7.)
10. The *Haustellum*, this is horny and stands out, consisting often of a bi-valve vagina, (Plate VIII. fig. 8.) and of fine bristles varying in number, (Plate VIII. fig. 8, b b b.)

Of the above parts most insects have four palpi, two mandibulæ,

mandibulæ, two maxillæ, a clypeus and a labium. Those that have a tongue, a proboscis or haustellum, in general want the maxillæ.

§ 228.

The naked hard eyes of insects (§ 78) differ from those of other animals in being motionless, and in being composed of numerous hexagon plates. (Plate VIII. fig. 10. 11.) In some, as the Monoculus, Scorpio and Aranea, they are simple; and in the Cancer, some Cimices and the Diopsia, they are moveable and are supported on a peduncle.

Most insects have two eyes; the Gyrinus has four. Most spiders and scorpions are furnished with eight simple eyes. (Plate VIII. fig. 15. a.) One spider has six. They are situated for the most part on the sides of the head, and are distant from each other, (*distincti*.) In the Monoculus, they are close, (*approximati*): in spiders they are arranged along the forehead (*frontales*;) and in scorpions on the sides and back of the thorax.

In general the eyes are prominent, as in butterflies, the Cicindela and Carabus; in the Monoculus they are inserted in the crust or shell which covers the body, (*testæ innati*;) in some crabs and lantern-flies, they lie in appropriate depressions, and in some beetles, they are covered above.

In figure the eyes are spherical (*globosi*;) as in spiders; long as in the Lampyrus; kidney shaped as in wasps, &c.

§ 229.

Besides these larger eyes, many insects have three small spherical bodies placed triangularly on the crown of the head, called *ocelli* or *stemmata*. (Plate VIII. fig. 6. f. They are simple and made for viewing large and distant objects; the other eyes for small and near ones.

§ 230.

The Antennæ are organs peculiar to insects, and probably serve as an instrument of the sense of touch, or as Linnæus supposes, of some sense to us unknown.

They are of a horny substance, articulated, for the most part moveable, and of very various figure. The Gyrinus has rigid antennæ.

The



The most common number is two: the Onisci have four, some species of Cancer have six, and the Araneas and some Acari alone want them.

They are commonly seated on the forehead between or before the eyes; sometimes, as in the Cerambyx, upon the eyes; and sometimes under them, as in the Fulgora, the Notonecta and Nepa.

Sometimes they are very short, (*brevissima*), as in the Notonecta, Hippobosca, &c. often shorter than the body, (*breves*); of the same length with the body, (*mediocres*), in some Cerambyces, as the Cerambyx *edilis*; and in some Grylli they are longer than the body, (*longissima*.)

For the different forms of the antennæ see Plate IX. and its description.

#### § 231.

The *frons* is the upper part of the head from the thorax to between the eyes and the mouth: with regard to figure and surface its varieties receive the same names with those of the head (§ 226) but it may be remarked that in some Grylli it is pointed, (*acuminata*); in the Cancer *Astacus* it has the appearance of a rostrum, (*rostrata*); and in the Fulgora it is elongated, (*turrita*.)

The throat (*gula*) is the under part of the head, from the mouth to the breast.

#### § 232.

The trunk (*truncus*\*) consists in most insects but of one articulation; in some of two, and sometimes of three, as in many of the Neuropterous insects, and some others, as the Sphæx *inaurata*. The upper part of the trunk is called the *thorax*, the under the breast (*pectus*). Behind the thorax lies a small appendage called the *Scutellum*.

With regard to the varieties in the form of the thorax, the following are the most remarkable. It is small, (*linearis*) in the Mantis; round, (*orbiculatus*), in the Silpha; oval in the Carabus; angulated in the Gryllus; globular in the Leptura *Arietis*, *detrita*, &c.; cylindrical

\* This term seems to be applied by Linnæus and other Entomologists to the thorax alone.

dical in the *Cerambyx scalaris*; depressed as in the *Silpha*; compressed as in the *Grylli*, and some *Cicadæ*, &c.

With respect to its surface it is smooth (*laevis*, *glaber*); hairy, (*pilosus*); as in Butterflies; *villosus*, in the *Cerambyx*, *baiulus*; *pubescens*, in some *Elateres*; *bispidus*, in the *Scarabæus indus*; *setosus*, in some *Muscæ*; *rugosus*, in the *Cerambyx Gerdo*; *fulcatus*, in the *Scarabæus didymus*; *plicatus*, in the *Cancer Pagurus*; *punctatus*, *scaber*, in many insects; *bilobatus*, as in the *Scarabæus bilobus*; *tuberculatus*, as in many *Scarabæi*; *verrucosus*, as in the *Grylli*, &c.; *aculeatus*, in the *Cancer*, *Hispæ*; *cornutus*, as in some *Scarabæi*; *carinatus*, as in some *Grylli*; and the carina sometimes serrated, as in the *Gryllus ferratus*.

On the sides it has sometimes a rim, (*marginatus*), as in the *Silpha* and *Tenebrio*; set with spines, (*spinosus*), as in the *Cerambyx*; *dentatus* in the *Cerambyx coriarius*; *ciliatus*, in the *Aphis* and *Monoculus*; *foliaceus*, in the *Mantis*.

It is generally shorter than the abdomen; in some species of the *Curculio* and *Mantis*, it is nearly as long. In the *Cancer* and *Monoculus* it is covered with a hard shell, (*testatus*, *incrustedus*.)

### § 233.

The Scutellum is separated from the thorax by a transverse line, and lies between the wings or wing-cases; the particular use of this part is unknown. Fabricius thinks it assists the expansion of the wings in flight; but many insects want it, (*insecta exscutellata*), as all the *Lepidoptera* and some of the *Coleoptera*, though these expand their wings as well as those that are furnished with it, (*scutellata*.)

In general it is shorter than the abdomen; in some species of the *Cimices* and *Grylli*, it is longer than the abdomen. It is variously shaped: it is almost round, in the *Scarabæus*; oval in the *Cerambyx*; triangular in some *Scarabæi*; quadrangular in the *Sphex*; in some *Cimices* it covers the whole abdomen, (*scutatum*;) )

(*scutatum*;) in others it is divided at the point (*bidentatum*.)

§ 234.

The *sternum* is a ridge running under the breast; it is sometimes short (*abbreviatum*); sometimes long (*elongatum*), as in the Buprestis; sometimes divided (*bifidum*), as in the Dyticus *latissimus*; sometimes pointed (*acuminatum*, *mucronatum*), as in the Elater; sometimes it is armed with a spine, as in the Dyticus *piceus*; and sometimes with a horn, as in the Buprestis *sternicornis*.

§ 235.

The abdomen consists of articulated rings, differing in number, which have spiracles or air holes (*spiracula*), on the sides; the upper surface of it is called the *tergum*, the under the *venter*.

Many of the varieties of the thorax are likewise common to the abdomen; but the following are peculiar to it: the form is sometimes conical, as in the *Apis conica*; club-shaped, (*fulcatum*), as in the Ichneumon; hook shaped (*hamosum*), as in the Conops *ferruginea*; lance shaped, (*lanceolatum*), as in the Sphinx.

The end of it or the tail, (*cauda*) is pointed, as in the Mordella; with a sharp point, (*mucronata*), as in the Sirix; or with a sting, (*aculeata*), as in the Hymenoptera. Sometimes it is set with hairs, (*barbata*), as in the Sphinx *stellatarum*, &c. sometimes with bristles, (*setosa*), as in the Ephemera; divided, (*bifurca*), and bent in, (*inflexa*), as in the Podura; sometimes it ends in a kind of forceps, (*forcipata*), as in the Forficula and Libellula; or in a claw, (*chelata*) as in the Panorpa.

The sting, (*aculeus*) is generally a very fine sharp-pointed tube, that either lies in a particular sheath, (*vaginatus*), and is then exerted; or within the abdomen, (*reconditus*). It serves Insects as a weapon of defence, and likewise for perforating the places in which they deposit their eggs; and accordingly the females are most commonly furnished with it.

§ 236.

Most insects have six feet; Spiders have eight. The Onisci and Scolopendræ have still more, and the Iuli have

have sometimes upwards of an hundred feet. In those that have six, they are generally attached to the breast, (*pectorales*), or four to the breast and two to the abdomen, (*abdominales*), or two to the breast and four to the abdomen. In the Cancer dorsipes some are attached to the back, (*dorsales*), and the Juli have some attached to the tail, (*caudales*).

Each leg (*pes*) consists of the *femur*, *tibia* and *tarsus*, which last is made up of several articulations, and often at the end is furnished with claws, (*unguiculatus*), as in the Scarabæus, Gryllus, Afilus, and Hippobosca. In the Cancer, Scorpio, and others, the fore-feet, (*brachia*), end in chelæ, (*manus*).

The feet are formed in some for running, (*cursorii*), and are generally equal in length ; in others, as in some Butterflies, they are formed for walking, (*gressorii*), and the forefeet are then the shortest. Sometimes they serve for digging, (*fossorii*), as in the Gryllus Gryllotalpa, in which the tibia is compressed and dentated ; sometimes for leaping, (*saltatorii*), with long and strong hind-legs ; or for swimming, (*natatorii*), when they are situated nearly in a horizontal position, are compressed, and fringed with hairs, as in water insects. The males of some insects, as the Dyticus and Sphex, have on the fore-feet small cups or plates, convex above and rough below, with which, at the time of pairing, they seize and retain the female.

§ 237.

The wings of insects are attached to the thorax ; and are either of a horny or membranaceous substance. The horny wings cover the membranaceous ones and the abdomen, and are called the wing-cases, (*elytra*). The membranaceous wings have often no horny covers, and are either two or four in number. In the last case the hinder wings, (*ala postica*), are covered by the anterior wings, (*primares*). Of each wing we distinguish the upper and under surface, (*pagina, superior, inferior*) ; the anterior, posterior, and interior angles ; with the anterior, pos-

terior, and exterior margins. (See Plate VII. fig. 8. Some insects are destitute of wings, (*aptera*).

In most cases the elytra are separate, but they are sometimes united and form but one piece; in this case the membranaceous wings and the scutellum are wanting, and the insect is incapable of flying. The inner margin of the elytra, which, when they are at rest, are close and form a straight line, is called the *futura dorsalis*, *longitudinalis*; the anterior, by which the elytra are connected with the thorax is called the *futura transversalis*; and the outer is peculiarly the margin, (*margo*.) On account of the various figure of the elytra it is likewise found necessary to distinguish the base, (*basis*), the surface, (*discus*), and the points, (*apex*).

Sometimes the hard part of the elytra are furnished at the apex with a membranaceous appendage, and are then called *Hemelytra*.

#### § 238.

In general the elytra cover the whole abdomen; but sometimes they are short, (*abbreviata*, *dimidiata*), as in the *Meloe*, *Necydalis*, and *Staphylinus*; they are sometimes of equal breadth throughout, (*linearia*), as in the *Cerambyx* and *Elater*; sometimes growing gradually narrower, (*attenuata*), as in the *Leptura*.

At the apex they are rounded, (*rotundata*), as in the *Gryllus*; pointed, (*acuminata*), as in the *Tenebrio*; as if cut off transversely, (*truncata*), as in the *Staphylinus*; notched, (*emarginata*), as in the *Leptura* and *Buprestis gigantea*.

The margin is sometimes bordered, (*marginata*), as in the *Silpha* and *Cassida*; toothed, (*ferrata*), as in the *Buprestis mariana*; or waved (*sinuata*), as in the *Silpha sinuata*.

The elytra are flexible, (*flexilia*), in the *Cantharis*; soft, (*mollia*), in the *Meloe*; downy or woolly on the surface, (*tomentosa*, *villosa*, *pubescentia*); in the *Chrysomela pubescens*, hirta; hairy, (*pilosa*), in the *Scarabæus hirtellus*; smooth, (*lævia*); rough, (*scabra*), in the *Curculio scaber*; rough with warts, (*verrucosa*, *tuberculata*), in the *Curculio*



*Curculio verrucosus* ; furrowed, (*fulcata*) ; striated (*striata*) ; striated with raised dots, (*porcata*), in the *Carabus auratus* ; wrinkled, (*rugosa*), in the *Silpha rugosa*, and *Carabus coriarius* ; streaked with other colours, (*lineata*), in the *Chrysomela fastuosa*, *cerealis*, and *Elatér lineatus* ; set with strong stiff hairs, (*hispidus*), in the *Cerambyx hispidus* ; or with spines, (*spinosa*), in the *Hispia*.

There are likewise some species of insects without wings, where the other species of the genus have them, as the *Cerambyx pedestris*, some *Carabi*, *Cimex apterus*, &c. The females of some *Phalænæ* too want wings.

With regard to position, the wings of some insects stand erect, (*erectæ*), as in the *Papilio* ; spread out, (*patentes*), in the *Phalænæ Bombyx*, *Geometra*, &c. ; opposite, (*divaricatæ*), in the *Libellula* ; lying over one another, (*incumbentes*), in the *Phalæna Noctua* ; hanging down, (*deflexæ*), in the *Phalæna dispar* ; rolled round the abdomen, (*convolutæ*), in the *Tineæ* ; reversed, (*reversæ*), in the *Phalæna quercifolia* ; plain, (*planæ*) in the *Apis* ; folded, (*plicatæ*), in the *Vespa* and *Gryllus*.

They are either naked as in the *Hymenoptera* ; covered with scales (*squamatæ*), as in the *Lepidoptera* ; hairy, (*pilosæ*), as in the *Muscæ* ; of the same colour on both sides, (*concolores*) ; spotted, (*maculatæ*) ; marked with transparent spots, (*fenestratæ*) ; or with spots like eyes, (*ocellatæ*) ; dotted, (*punctatæ*) ; marked with stripes, (*fasciatæ*), &c.

On the margin they are tailed, (*caudatæ*) ; cornered, (*angulatæ*) as in the *Papilio Rhamni* ; dentated, (*dentatæ*) as in the section of *Nymphæales* ; notched, (*emarginatæ*), as in the *Phalæna Pyralis emargena* ; unequally notched, (*erosæ*), as in the *Papilio C. album* ; or set with hairs, (*ciliatæ*), as in the *Musca*, &c.

§ 239.

Insects with two wings have behind each, situated upon the thorax, a small spherical body supported on a pedicle which is called a poiser, (*halter, libramentum*), and is often protected by an arched scale. The use of this

is not perfectly ascertained ; it is generally believed that it serves to poise or keep the insect in equilibrium while flying ; some suppose that it makes the peculiar humming noise generally attributed to the wings.

§ 240.

Insects are of two sexes, male and female. In Bees and Ants, the working individuals are called neuters, (*neutra. spadoes*), and are supposed to be barren. Some late observations, however, shew that they, at least the working Bees, lay eggs, and that by superabundant nourishment, they may be turned into perfect and fertile females.

In the genera of Aranea, Cancer, Oniscus, and Scorpio, the male organs are double, and in some they differ as to situation. In the male Spider they are placed in the head in the form of club-shaped palpi. In the female they are at the origin of the abdomen. In the males of the Libellulæ they are at the breast, in the females at the extremity of the abdomen.

§ 241.

The two sexes in some species of insects are sometimes very different in appearance. The females in general are the largest ; sometimes they want wings, while the males have them ; as in some Phalænæ, the *Lampyrus noctiluca*, and *Termes fatale* ; they are often likewise of different colours, as the *Phalæna Humuli*, &c.

The intercourse of the sexes among insects generally happens at random, without pairing or polygamy ; for even among Bees, there is no such thing as a plurality of males ; the working Bees are females which are impregnated by the drones. That Ants and the *Termes fatale* are monogamous, has been asserted, but not ascertained.

Insects live but a short while after the work of generation is performed ; and what is singular, the male Spiders are immediately killed by the females.

Most insects are oviparous. The Aphides lay eggs at the end of Autumn, and the young produced from those eggs in the spring, are viviparous during the whole summer. The females of this genus without any intercourse  
with

with a male, produce females, which, likewise without such intercourse, are fertile to the fourth generation, according to the experiments of Reaumur, Bonnet, De Geer, and others. In harvest, males are likewise produced, which engender with the females, and then they become oviparous. The Cocci hatch their eggs before exclusion, and the young force their way through the abdomen of the mother. The Onisci carry their eggs in a particular receptacle, from which, in process of time, the young escape. Scorpions, some flies and Monoculi, are likewise viviparous.

§ 242.

The females, when impregnated, deposit their eggs with great care in that particular place which affords the most proper nourishment to the young when excluded. But as soon as this duty is performed, they for ever abandon them, leaving them to be hatched by the warmth of the atmosphere. Working Bees and Ants alone, of the whole tribe of insects, take any care of their larvæ. Spiders carry their eggs about with them, but do not seem to assist the young in any degree, when they burst their prison.

The fertility of insects is very great. The *Phalæna Caja* lays 1600 eggs. The Queen Bee about 4000, some say 12000. The *Flesh-fly* 20,000\*.

§ 243.

Few insects live during the winter. Some that have been produced late in the season, and which have not had an opportunity of propagating their kind, conceal themselves in holes, and appear early in the spring.

§ 244.

Insects are found in every part of the world, even in the smallest islands. In very cold regions they are not numerous. They live in every situation; on land and in the water; in fresh waters as well as in the sea. Many inhabit the water in their larva state, then go below ground to pass the period of their existence as a Pupa, and

\* For the numbers of Insects see *Insecto-Theology*, P. 321.

and, when become perfect insects, they mount into the air. Their food is various. Some live on filth, and on carcases; some on living animals; man himself is obnoxious to their attacks; and many feed on plants. Some migrate from one region to another, as the Locusts, and some species are as extensively spread over the face of the earth as the plants on which they feed.

Larvæ often feed on matters which, when perfect insects, they will not touch. Many gnaw the roots of plants, as the larvæ of the Meloe, and of several Phalænæ; others penetrate the wood, as the Ptinus; and most of them eat the leaves. Such as live on other larvæ, must employ various artifices to entrap their prey, such as the Formicaleo, the Water Scorpion, &c.

The perfect insects likewise live on food of different kinds; for the most part they suck the juices of other animals and plants, as Butterflies, Muscæ, &c. some in this state never take any nourishment, as the Ephemera, &c.

#### § 245

Insects are furnished with particular organs for avoiding or resisting their enemies. Besides their eyes, by which they quickly discover approaching danger, they are provided with weapons of defence, such as hairs, spines, stings, &c. Some discharge a fluid, as the Phalænæa Cossus, the Silpha, the Carabus, &c. The Cicadæ conceal themselves in a froth. The Phryganeæ make artificial cases and sometimes abodes under ground. The Tortrices wrap themselves up in a leaf. Some of the Tineæ live between the two membranes of a leaf, &c.

Others avoid danger by leaping, as the Elater, the Chrysomela oleracea, the Grylli, the Cicadæ, &c.; others by running, as the Carabi, the Cicindelæ, &c. The Cimices protect themselves by dispersing a fetid smell. Some Caterpillars have the appearance of a piece of withered stick; and others are so like in colour to the plants on which they feed, as to be with difficulty distinguished from them.

In

## § 246.

In the economy of nature insects are principal agents: They perform their functions chiefly in the day; but some only in the evening and at night, as Moths, the *Dytici*, &c. By them chiefly is the proportion maintained between the vegetable and the animal kingdoms, (§ 112). They purify the atmosphere by feeding on the putrid carcases of animals, as the *Silphae*, the *Staphylini*, *Tenebriones*, &c.; the larvae of Flies, such as the *Musca putris*, *stercoraria*, *simetaria*, &c. feed on the dung of other animals; the larvae of some Beetles penetrate rotten wood, and accelerate its conversion into earth; the larvae of Gnats purify foul and stagnant waters, and restore their fluidity.

Many diminish the numbers of other insects; thus the *Sphages*, the *Carabi* and *Cicindelae*, devour larvae; Spiders, the *Afili*, and *Mantes*, prey on other insects; the *Aphides* are preyed on by *Coccinellae* and some *Muscae*.

Many insects, particularly the larvae of the *Lepidoptera*, *Beetles*, and *Grylli*, live on plants and weeds, and prevent their too great increase; they are also of advantage to fruit trees, by feeding on the superfluous leaves. Every plant maintains some insect, and some of them more than one kind; there are plants, particularly the poisonous ones, that seem to have been created purposely as food for particular insects.

Others assist the fructification of plants; the *Cynips Pfenés* and *Sycomoré*, carry the farina fecundans to the female fig, and the *Tipula pennicornis* to the *Aristolochia*. The immense quantities of insects which are produced, must enrich the ground when they die.

Besides, insects furnish the proper food of many other animals, particularly of various Birds, Amphibia, and Fishes. Even some Quadrupeds feed on them exclusively, such as the Ant-eaters. Many of them are eminently useful to man. Crabs, and the larger Locusts, are frequently eaten. Bees and Wasps prepare for him honey and wax. Some produce cochenille, others galls, and others silk. Medicine and the Materia Medica are also indebted to some of the animals of this class.

On

On the other hand, Insects are noxious to man in many respects. Many Caterpillars lay waste the meadows, fruit trees and plants. The *Curculio granarius*, *frumentarius*, and *Tinea granella*, &c. gnaw the seeds of corn. The *Chrysomela cleracea* feeds on the seminal leaves of tender plants, and the Locusts often destroy the produce of whole regions. Some eat the roots of plants, and others feed on the wood. Bees suffer from the *Tinea mellonella*, *Pyralis cereana* and *Attelabus apiarius*. Horses, Goats, Rhen-deer, Oxen, Sheep, &c. are infested by the *Oestrus*, *Tabanus*, *Conops*, and other insects. The furniture of houses is destroyed by some, and man himself is not exempted from the attacks of many species.

§ 247.

Of Books on Entomology, which are very numerous, the following are the principal.

- Jo. Goedart, *Metamorphosis et historia naturalis de insectis*, 8vos Mediob. 1667.  
*Idem*, *de Insectis in methodum redactus*, opera Mart. Lister, 4to. Ebor, 1675, 8vo. Lond. 1685. (List. mut.)  
 Jo. Swammerdam, *Biblia Naturæ: s. Historia Insectorum in classes redacta*. Leyd. 2 vols. fol. 1737.  
 Same, translated, with notes, by John Hill, fol. Lond. 1758.  
 M. S. Merian, *Metamorphosis Insectorum Surinamensium ad vivum picta et descripta*. Amst. 1705 folio.  
*Histoire d' Insectes d' Europe et de Surinam*, par M. S. Merian. Amst. 1730, folio.  
*Memoires pour servir a l'histoire des Insectes*, par M. de Reaumur, in 6 vols. 4to. Paris 1737, &c.  
*Memoires pour servir a l'histoire des Insectes*, par Ch. De Geer, in 7 vols. 4to. Stockh. 1752, &c.  
*Traité d' Insectologie*, par Ch. Bonnet, 8vo. Paris 1748.  
*Theologie des Insectes de Lesser*, avec des remarques de Lyonet; Haye 1747, 8vo.  
*Insecto-Theology*, or a demonstration of the Being and Attributes of God, &c. with the Notes of Lyonet; 8vo. Lond. 1799.  
*Insectorum theatrum*, Thomæ Mouffeti opera concinnatum. Lond. 1634, folio.  
 Same, translated, Lond.  
 Jo. Raii, *Historia insectorum*. Lond. 1710, 4to.  
 Mart. Lister, *Historia animalium Angliæ*. Of which one treatise, *De Araneis*. Lond. 1678, 4to.

- A natural History of Spiders and other curious insects, by Eleaz. Albin. Lond. 1736, 4to.
- Svenska Spindlar: Caroli Clerk, Aranei Suecici figuris et descriptionibus illustrati. Stockh. 1757.
- Catalogue raisonné ou systématique du genre des Insectes qu'on appelle Coleoptères, par Jean Eusebe Voet. Haye 1766, 4to.
- Voet, Icones Insectorum Coleopterorum, a D. G. Wolfgang. Erlang. 1796, 4to.
- De vitlandsche Kapellen, door P. Cramer. Amst. 1775, 4to.
- Olivier Entomologie, ou Histoire Naturelle des Insectes, in 3 vols. 4to. Paris 1780, &c. Coleoptera only.
- Natuurlyke en naart Leeven naauwkenrig geleurde Afbeeldingen en Beschryvingen der Cicaden en Wanzen, &c. door Kasp. Stoll. Amst.
- Archiv. der Insektengeschichte herausgegeben, von Joh. Casp. Facslly. Zurich 1781, 4to.
- The same translated. Lond. 1795, 4to.
- A. W. Knoch, Beytraege zur Insektengeschichte. Leip. 1781, 8vo.
- A natural history of English insects, by Eleazar Albin. Lond. 1720, 4to.
- Moses Harris, An Exposition of English Insects, &c. with coloured plates, 4to. Lond. 1776.
- The Aurelian: or Natural History of English Insects, namely, Moths and Butterflies, fol. Lond. 1778.
- Benjamin Wilkes, One hundred and twenty copperplates of English Moths and Butterflies. 4to. Lond. 1773.
- James Barbut, The Genera Insectorum of Linnæus, exemplified by various specimens of English Insects drawn from nature, 4to. Lond. 1781.
- The English Lepidoptera; or Aurelian's Pocket Companion, 8vo. Lond. 1776.
- E. Donovan, The Natural History of British Insects, illustrated by coloured figures, in 7 vols. 8vo. Lond. 1792-98.
- W. Lewin, The Papilios of Great Britain systematically arranged and painted from nature, 4to. Lond. 1795.
- Illustrations of Natural History, by D. Drury. Lond. 1770, in 3 vols. 4to.
- Car. Linnæi, Fauna Suecica. 8vo. Stockh. 1761.
- Histoire abrégée des Insectes qui se trouvent aux environs de Paris, par M. Geoffroy, à Paris, in 2 vols. 4to. 1764.
- Jo. Ant. Scopoli, Entomologia Carniolica, Vindob. 1763, 8vo.
- O. F. Mulleri, Fauna Insectorum Fridrichsdalina. Hafn. 1764, 8vo.
- Christ. Sepp, Nederlandische Insecten. Amst. 1762, 4to.
- Fr. Paulla v. Schrank, Enumeratio Insectorum Austriæ indigenorum. Aug. Vindel. 1781, 8vo.
- VOL. II. C

- P. Sim. Pallas *Icones Insectorum Rossiae et Siberiae indigenorum*.  
Erlang. 4to. 1781.
- J. C. Schaeffer, *Icones Insectorum circa Ratisbonam indigenorum*.  
Ratisb. 1767, 4to.
- L. Cyrillo, *Entomologiz Neapolitanæ specimen*. Nap. 1789, fol.
- Pet. Rossi, *Fauna Etrusca, sistens Insecta in Provinciis Florentina  
et Pisana, in 2 vols. 4to.* Legh. 1790.
- Diversæ Insectorum volatilium Icones*, per J. Hoefnagel. Frank.  
1630, 4to.
- Insectes graves en maniere noire*, par Jac. l'Amiral. Amst. fol.
- Car. Clerk, *Icones Insectorum rariorum cum nominibus eorum  
trivialibus*. Holm. 1764, 4to.
- J. Ed. Smith, *The Natural History of the rarer Lepidopterous  
Insects of Georgia, in 2 vols. fol.* Lond. 1797.
- Linnæi *Systema Naturæ*, Class V.
- M. T. Brunichii *Entomologia, sistens tabulas systematicas, cum in-  
troductione et iconibus*. Hafn. 1764, 8vo.
- J. C. Schæfferi, *Elementa Entomologica, 135 tabulæ ære excusæ*.  
Ratisb. 1766, 4to.
- Jo. Christ. Fabricii, *Systema Entomologiæ*. Lips. 1775, 8vo.
- *The same in 7 vols. 8vo.* Hafn. 1797.
- *Genera Insectorum*. Chil. 1776, 8vo.
- *Species Insectorum*. Hamb. 1781, 8vo. in 2 vols.
- *Philosophia Entomologica, sistens scientiæ fundamenta*,  
&c. Hamb. 1778, 8vo.
- Linnæi *Fundamenta Entomologiæ*. Upsal 1767, 4to. and in  
Amæn. Acad. vol. 7th.
- J. Jac. Roemer, *Genera Insectorum Linnæi et Fabricii, iconibus  
illustrata*. Wintert. 1789, 4to.
- G. W. F. Panzer, *Faunæ Insectorum Germaniæ Initia*. Nurnb.  
1798, &c. with coloured figures.
- N. J. Brahm, *Insecten Kalendar fur Sammler und Oekonomen*.  
Mentz 1790, 8vo.

## § 260.

The animals of this class are divided by Linnæus into the following seven Orders, according to the number and different structure of the wings.

ORDER I. COLEOPTERA. With crustaceous wing-cases, and for the most part with two wings. (Plate VII. fig. 1.)

ORDER



## ENTOMOLOGY.

29

**ORDER II. HEMIPTERA.** With the upper wings half crustaceous, and half membranaceous; not divided by a longitudinal suture, but crossed or incumbent on each other; or with four wings. (Plate VII. fig. 2, 4).

**ORDER III. LEPIDOPTERA.** With four wings covered with fine scales, like powder; and with a spiral tongue. (Plate VII. fig. 8. 11.)

**ORDER IV. NEUROPTERA.** With four membranous transparent wings, generally reticulated with veins or nerves. (Plate VII. fig. 15.

**ORDER V. HYMENOPTERA.** With four membranous wings; the tail furnished with a sting. (Plate VII. fig. 18.)

**ORDER VI. DIPTERA.** With two wings only. (Plate VII. fig. 21.)

**ORDER VII. APTERA.** Without wings. (Plate VII. fig. 23).

The generic characters are taken from the Antennæ; the parts of the mouth, the structure of the head, thorax, and abdomen: the habit, the metamorphosis, and manner of life, have often so much resemblance, as to assist in distinguishing the species of a genus. But the species are chiefly determined by the colour, and by the various structure of the particular parts.

## § 250.

The system of Fabricius has acquired great reputation on the Continent. It is not so simple or so convenient as that of Linnæus; it is founded on the parts of the mouth which are often very small, and so minute as to require the aid of a magnifier. But he has described these parts so accurately, (§ 227.) that many of them have since been made use of in characterising the Genera. It may not therefore be amiss to give a sketch of his arrangement.

He divides insects into eight classes.

**CLASS I. ELEUTERATA.** Mouth armed with maxillæ, and four or six palpi. The maxillæ naked and free.

**CLASS II. ULONATA.** The maxillæ covered with an obtuse galea.

**CLASS III. SYNISTATA.** The maxillæ united with the labium.

**CLASS IV. AGONATA.** The under maxilla wanting.

**CLASS V. UNOGATA.** Mouth armed with maxillæ and two palpi; the under maxilla generally furnished with a small unguis or nail.

**CLASS VI. GLOSSATA.** Mouth furnished with palpi, and a spiral tongue.

**CLASS VII. RYNGOTA.** Mouth furnished with a rostrum, and an articulated vagina.

**CLASS VIII. ANTLIATA.** Mouth furnished with an haustellum; and a vagina not articulated.

Though

Though some of these classes are natural, others of them include insects of very different forms and manners. Thus, for instance, the Class SYNISTATA includes the Ephemera and the Oniscus, the Vespa and the Monoculus; and in the Class UNOGATA, we find the Scolopendra and Aranea, joined with the Libellula.

We now proceed with the arrangement of Linnæus.

### § 256.

#### ORDER I. COLEOPTERA. \*

THE Insects of this Order (the *Eleuterata* of Fabricius), make a very natural division. They have hard cases to their wings, with a longitudinal future; these in some are united, and therefore such insects can have no wings; but the wings in most are two. At the mouth in general they have four, seldom six palpi; two horny and two coriaceous maxillæ; the mouth is covered above with the clypeus; and closed below by the lips: they have all six feet in their perfect state; for the most part eleven articulations in the antennæ which lie between the two reticulated eyes; they have a hard horny skin; on each side they have nine spiracula, one on the thorax, and eight on the abdomen. The females lay their eggs in the earth, in wood, &c. and from these proceed the larvæ.

The larvæ have six short feet near the head; jaws at the mouth; two eyes; often short antennæ; and on each side nine spiracula. They feed mostly on plants and their roots; they move slowly; others live on dead animals, and these are more active; others, as the *Dyticus*, which

\* From *κολλας* a sheath or case, and *πτερ πτερος* a wing.

which feed on living animals, are very rapid in their motions. The larva state, during which insects change their skins, endures in most species for a year; in the larger species longer, sometimes three or four years. When the larva arrives at its appointed time, it draws itself together, and changes for the most part into a Pupa *incompleta*, (§ 223) which, sometimes below the earth, or in rotten wood, reposes for several weeks or months. In some species the Pupa is *femi-completa*. Afterwards the skin of the Pupa bursts, and the perfect insect appears. It is now fit for the propagation of the species. Some live on plants and others on animal bodies. In respect of structure, size, motion, colour, manner of life and properties, they are different.

GEN. I. SCARABÆUS. The antennae clavated; the club lamellated; four palpi; the mandible horny, in general without teeth; the tibiae, or second joint of the foremost pair of feet, generally dentated.

This is a very numerous genus, containing no less than 433 species; but it has been divided by Fabricius into six genera, each of these in the *Systema Naturæ*, forming only separate sections. Thus the first section contains the Scarabæi of Fabricius, &c. as follows:

- \* With filiform palpi.
    - † The mandible arched.
      - a. Evidently without teeth. *Scarabæi.*
      - b. Somewhat dentated; the abdomen at the apex, not covered with the elytra, which are obliquely truncated. *Melolonthæ.*
    - †† The mandible straight.
      - a. acute. *Cetoniæ.*
      - b. obtuse. *Trichii.*
  - \*\* With knobbed palpi. *Trax.*
  - \*\*\* With cylindrical palpi; the club of the antennæ tunicated. *Lathrus.*
- The

SCARABAEUS.

The larvæ of the Scarabæi have six feet, they are annulated, hairy, with a vesicle at the apex of the abdomen; they have a hard horny head; they live inactively under ground; many of them are fond of dung, and feed upon it; the larvæ of the Cetonixæ feed on putrid wood; those of the Melolonthæ on the roots of plants. The Pupæ lie motionless under the soil.

\* *Scarabæi.*

a. *The thorax horned; with a scutellum.*

1. Scarabæus *Ælæon*. Smooth; two horns on the thorax; the horn on the head with a single dent; bifid at the point; the elytra smooth.

*Inhabits America.*

This is the largest of known insects, except some of the genus Cancer and Monoculus. The whole body is black and shining; the female wants the horns on the thorax, and has but a very small one on the head. These insects are common at Cayenne and Surinam.

2. Scarabæus *Typhæus*. The Bull-comber. Three horns on the thorax; the middle one the smallest; the other two extending forwards, and of the same length with the head, which has no horns.

*Inhabits Europe, &c. B.*

This species burrows in Cow-dung and under the earth, digging deep holes; it forms a nest, is of the same size with the Dorbeetle; of a black colour.

3. Scarabæus *mobilicornis*. The thorax with four dents; the horn on the head recurved and moveable.

*Inhabits Germany and England. B.*

In this species the female has no horn either on the head or on the thorax; the elytra are striated.

b. *The thorax horned; without scutellum.*

4. Scarabæus *Lunaris*. The Lunated Beetle. Three horns on the thorax; the middle one obtuse and bifid; the horn on the head erect; the clypeus emarginated.

*Inhabits Europe. B.*

This

## SCARABAEUS.

This species is nearly the size of the Dor-beetle. It lives in dung, and in dung-hills. The elytra are furrowed. The horn on the head in the female is short, and on the thorax there is never any.

*c. The thorax plain ; the head horned ; with a scutellum.*

5. *Scarabaeus Rhinoceros*. The Rhinoceros Beetle. The thorax with two eminences like tubercles, and hollowed on the anterior margin ; a single horn on the head ; the clypeus bifid ; the elytra punctured.

*Inhabits Asia.*

The Rhinoceros beetle is of a brownish black colour ; hairy below. The thorax of the female has a depression in the middle.

6. *Scarabaeus nasicornis*. Three prominences on the thorax ; the horn on the head recurved ; the elytra smooth.

*Inhabits Europe.*

This species varies in size ; it is larger in the south of Europe than about Paris. It is of a chestnut colour ; the under part of the body covered with ferruginous hairs. It is found in dung-hills, hot-beds, and about the roots of rotten trees.

*d. The thorax plain ; the head horned ; without a scutellum.*

7. *Scarabaeus nuchicornis*. The thorax rounded ; an erect spine on the hind part of the head.

*Inhabits Europe. B.*

This species is likewise found in dung. The head and thorax of a bronze colour ; the elytra ash-coloured with minute black dots ; the female wants the horn.

8. *Scarabaeus verticicornis*. The thorax greyish, with black dots ; the horn on the head erect and very short.

*Inhabits England. B.*

This is so like the former species, that it is probably but a variety of it.

*e. Without*

SCARABÆUS.

e. *Without horns, either on the head or the thorax ; with a scutellum.*

9. *Scarabæus fimetarius*. Black ; the head tuberculated ; the elytra reddish.

*Inhabits Europe. B.*

This species is very common, and appears early in spring, in a warm sunny day, on high ways where horses have been passing, and alights near their dung.

10. *Scarabæus hæmorrhoidalis*. Head tuberculated, the elytra red at the points.

*Inhabits Europe. B.*

This species is found in fungi, and among putrid substances ; and is, perhaps, but a variety of the *granarius*.

11. *Scarabæus conspurcatus*. The side margins of the thorax whitish ; the head tuberculated ; the elytra grey with black spots.

*Inhabits Europe. B.*

Frequent in spring ; found in dung-hills ; is like the *fordidus*, but smaller.

12. *Scarabæus ferdidus*. Head tuberculated ; thorax black, the rim pale, with a black point ; the elytra grey.

*Inhabits England.*

Is found chiefly in Cow-dung, like the preceding, but wants the spots on the elytra ; they are both small species.

13. *Scarabæus Fossor*. The thorax slightly hollowed before : three tubercles on the head ; the middle one resembling a horn.

*Inhabits Europe. B.*

Of an oval elongated shape ; black, convex, and shining ; the elytra striated ; there is a variety with reddish, or reddish brown elytra ; it is found in Cow-dung.

14. *Scarabæus terrestris*. The head with three equal tubercles ; the elytra striated.

*Inhabits England.*

Like the *Fossor*, but only one third of its size. It is black and shining, and found likewise in Cow-dung.

## SCARABÆUS.

15. *Scarabæus confagratus*. The head with three tubercles ; the clypeus and scutellum black and shining.

*Inhabits* Germany. B.

The whole body black except the elytra which are testaceous. Of the three tubercles on the head, the middle one is the largest.

16. *Scarabæus testaceus*. Head with two tubercles ; the elytra with dotted striae.

*Inhabits* England.

Of a brick-colour ; found in dung-hills.

17. *Scarabæus granarius*. Black, one tubercle on the head ; the elytra of a ferruginous colour at the extremities.

*Inhabits* Europe. B.

Of the size of a grain of wheat ; the body black and shining ; the elytra sometimes more than half ferruginous.

18. *Scarabæus stercorarius*. The Dor-beetle. Black and smooth ; the elytra fulcated ; the head rhomb-shaped ; the crown of the head with a prominence in the middle.

*Inhabits* Europe. B.

The *sword-borne beetle* of Shakespeare. When it flies in the evening with a loud hum, it presages a fine day. By the Egyptians it was consecrated to the Sun. It lives below ground. The female digs a hole, and kneads a lump of fresh dung, generally of a cylindrical shape, on which she deposits one egg, and then covers it with more dung, attaching it to the root of some grass. In a few days the larva breaks the egg and feeds on the fresh dung ; during the autumn it changes its skin four times, and continues in an inactive state during the winter ; in spring the beetle appears. It sometimes varies in colours, verging to bluish or greenish. It is much infested by the *Acarus Coleopterorum* and the *Ichneumon*.

19. *Scarabæus vernalis*. The elytra smooth ; without striae ; the clypeus rhomb-shaped ; the crown of the head with a prominence in the middle.

*Inhabits* Europe. B.

This



SCARABAEUS.

This species is very like the former but less. It is smooth, shining, with red antennæ, of a bluish or dark greenish colour. It is chiefly met with in spring.

20. *Scarabaeus quisquilius*. Black and smooth; the elytra of a livid black colour.

*Inhabits* Europe. B.

Of the size of a grain of millet. Is frequent in spring on high ways, among horses dung; the elytra are striated.

21. *Scarabaeus testudinarius*. Black; the elytra sulcated, black, with ferruginous spots.

*Inhabits* Germany. B.

Frequent in England on dunged fields; the thorax is black and pubescent.

22. *Scarabaeus quadrimaculatus*. Black and oblong; the elytra with two black spots.

*Inhabits* Europe. B.

A very small species; found in dung and upon high-ways.

*f. Without horns either on the head or thorax, and without scutellum.*

23. *Scarabaeus sacer*. The clypeus with six indentations; the thorax crenulated; the hind tibiae ciliated; two small tubercles or dents on the crown of the head.

*Inhabits* the southern parts of the old world.

This insect was formerly worshipped in Egypt, and is found sculptured on the ancient Egyptian columns that are preserved in Rome. It makes a cylindrical lodgement of Cow-dung for its larva. It is larger than the Dor-beetle; the lateral margins of the thorax are ciliated.

24. *Scarabaeus ovatus*. Black; the clypeus emarginated; the thorax of a bronze colour; the elytra abbreviated.

*Inhabits* Calabria, Germany, &c. B.

Found in Cow-dung; like the nuchicornis, but only one fourth of its size.

\*\* *Melolonthæ*.

25. *Scarabaeus Fullo*. Of a brick-colour, spotted with  
D 2 with

## SCARABAEUS.

white ; the scutellum with two spots ; the antennae with seven plates in the club.

*Inhabits* Europe and Barbary. B.

This species is larger than the Cock-chaffer. It is found in sandy regions, and feeds on the oak, the *Elymus arenarius* and *Arundo arenaria*. It is rough below, with a hooked branch at the base of its claws. It is rare in England, but has been found near Sandwich.

26. *Scarabaeus ruricola*. Black ; filky ; elytra red, with a black margin.

*Inhabits* France. B.

It is more oval and more convex than the *horticola*, and somewhat less. The whole body is pubescent ; the under part of the body and feet black. It is found on bushes and different plants.

27. *Scarabaeus horticola*. The head and thorax bluish and hairy ; the elytra brown ; the feet black.

*Inhabits* Europe. B.

The larva of this species feeds on the roots of the *Brassica lotris* and *capitata*, but leaves untouched those of the *B. viridis* and *subauda*. The perfect insect destroys every sort of fruit-tree, except the common Pear.

28. *Scarabaeus Melolontha*. The Cock-chaffer, With a scutellum ; without horns ; of a brick colour ; the thorax villous ; the tail inflected ; the incisures of the abdomen white.

*Inhabits* Europe, particularly the northern parts. B.

The Cock-chaffer flies in the evening, and lives on the leaves of trees, particularly the maples, but does not touch the lime ; when it is numerous in autumn, it is said to pre-  
sage diseases ; oil in which it has been infused expels bugs ; it is eaten by Turkeys and by the Bat. The female digs a hole about half a foot deep, and there deposits her eggs, from which proceed larvæ with six feet of a white or greyish colour, which feed on the roots of plants, particularly of corn, for four years, changing their skin at least once a year. They are a favourite food of Crows. In winter they go deep into the soil to preserve themselves from the cold, and eat nothing. At the end of the fourth year, sometimes at the depth of a fathom, they go into the Pupa state, and continue till February, when the perfect insect appears, but soft and whitish, so that it does not venture to leave its abode below ground till

SCARABAEUS.

till the month of May. In flying it often strikes against persons and other objects as if it were blind, and hence comes the English proverb, "as blind as a beetle." The club of the antennæ is much larger in the males than in the females, and is divided into seven laminae.

29. *Scarabæus solstitialis*. With a scutellum; no horns on head or thorax; of a pale brown colour, the thorax villous; the elytra of a pale yellow, with three white parallel lines.

*Inhabits Europe.* B.

This species is less than the preceding, and appears later, being most frequent about the summer solstice. It flies at night and destroys the leaves of trees, particularly the Elm. The club of the antennæ is divided into three laminae.

\*\*\* *Cetoniae*.

30. *Scarabæus auratus*. With a scutellum; of a bronze colour; the first segment of the abdomen with a single dent on the sides; the clypeus nearly flat.

*Inhabits Europe.* B.

This species varies much in colour and size. The larva is found in putrid wood, and in ant-hills; the perfect insect on flowers, particularly those of the Peony, the Sorbus aucuparia, and the Rose; when touched it ejects from the anus a very fetid liquor.

31. *Scarabæus nobilis*. With a scutellum; smooth, and of a golden-green colour; the hinder part of the abdomen with white spots.

*Inhabits Europe.* B.

The whole upper part of the body is of a green, coppery, shining colour. The larva is grey, the head of a blood red, the feet yellowish; it is found in putrid wood; the perfect insect on flowers, particularly of umbelliferous plants.

\*\*\*\* *Trichii*.

32. *Scarabæus fasciatus*. With a scutellum; black, with a yellow tomentum; the elytra with two yellow united fasciæ.

*Inhabits Europe.* B.

This species is rare in England. It is found on the flowers of the Syringa, Filipendula, and the Umbelliferae. The elytra have two united yellow, or three interrupted black fasciæ.

## SCARABAEUS.

33. *Scarabaeus hemipterus*. With a scutellum; the thorax villous and margined, with two longitudinal wrinkles; the elytra abbreviated.

*Inhabits* Europe. B.

The larva lives in wood; the perfect insect on flowers; the female has a short rigid prickle at the anus.

\*\*\*\*\* *Trox*.

34. *Scarabaeus fabulosus*. With a scutellum; black, not shining, with rough tubercles; the antennae hairy at the base.

*Inhabits* Europe.

Found in dry sandy places; the body oval and black, but often covered with an ash-coloured dust.

\*\*\*\*\* *Lathrus*.

- 35 *Scarabaeus cephalotes*. The clypeus emarginated and bilobated.

*Inhabits* Tartary, Russia, &c.

This species is the link which connects this genus with the following. The elytra are united, consequently it has no wings; its feet are formed for digging; the mandible is hooked.

GEN. II. LUCANUS. The antennae clavated; the club compressed, with one side broader than the other, and cleft like a comb; the maxillae prominent, stretching out from the head and dentated; the two hindermost palpi attached under the lip to two pencils of hairs.

1. *Lucanus Cervus*. The Stag-beetle. With a scutellum; the maxillae projecting, bifurcated at the apex, with one dent on the side.

*Inhabits* Europe and Siberia. B.

This is the largest of the British Coleoptera; the larva is white and lives on putrid wood, particularly oak; its head and feet are of a rust colour. The perfect insect varies in size and colour; in general it is dark brown or blackish; the jaws are very large, about one third of the length of the whole insect, and have a distant resemblance to the horns of

**UCANUS.**

a Stag; the female, which is much less than the male, wants these, or at least they are shorter than the head.

1. *Lucanus parallelepipedus*. With a scutellum; depressed and black; an elevated dent on the side of the maxillae.

*Inhabits* France, Germany, Italy, &c. B.

Like the female of the former species, but only one eighth of its size; the female is less than the male, and its jaws are smaller; it has two prominent points on the head. Found on the trunks of decaying trees, particularly on old willows.

3. *Lucanus caraboides*. With a scutellum, and of a blue colour; the mandibles lunated; the thorax margined.

*Inhabits* Europe. B.

Found in thick woods; varies in colour, blue or green; the elytra like fine chagreen.

**GEN. III. DERMESTES.** The antennae clavated; the club perfoliated; the three terminating articulations larger than the rest; thorax convex, with scarcely any margin; head inflected, and partly hid under the thorax.

The larvae of the insects of this genus eat and destroy the carcasses of animals; they are exceedingly injurious to the meat in larders, to skins, furs, and books.

- i. *Dermestes lardarius*. Black, the elytra on the anterior part grey.

*Inhabits* Europe. B.

The larva is oval, ash-coloured, and downy; it feeds on meat long kept, on lard, flesh, the contents of larders, collections in museums, books, particularly such as are bound in leather not sufficiently freed of the hair; the perfect insect is fond of oily and fat substances, and such as are fatal to other animals.

2. *Dermestes Pellio*. Black; the elytra with a white point in each.

*Inhabits* Europe. B.

The larva is oblong, hairy, with a tuft at the tail; it feeds on skins, lard, and other dried animal substances, and old books.

## DERMESTES.

books. The perfect insect is found on flowers. It varies without points.

3. *Dermestes domesticus*. Black; the elytra grey, with black margins; the thorax villous.

*Inhabits Europe.* B.

The thorax is almost hemispherical. When touched it draws its head below the thorax, and its feet under the belly, and remains so motionless that it appears dead. It is this insect which makes the round holes in furniture.

4. *Dermestes violaceus*. Of a bluish black colour; the thorax villous.

*Inhabits Europe.* B.

Is found in carcasses as well as in flowers. It likewise draws in its head and feet when touched.

5. *Dermestes fumatus*. Oblong, and of a brown colour; the eyes black.

*Inhabits Europe.* B.

A small species, only half a line in length, and sometimes less. It has the habit of a *Scarabæus*, but its antennæ are those of a *Dermestes*. It is found in flowers, in Horse-dung, and likewise in houses.

6. *Dermestes tomentosus*. Oblong, villous, and grey, the head with two brown dots.

*Inhabits England and Sweden.*

Found on flowers.

7. *Dermestes sexdentatus*. Oblong; brown; the thorax sulcated; with six dents on each side.

*Inhabits Germany, &c.*

This minute insect is not in Gmelin. It is a Fabrician species, inserted in Panzer's *Fauna Germaniæ*. It is frequently found in this country in raw sugar, and may perhaps have been brought from the West Indies.

GEN. IV. BOSTRICHUS. Antennæ clavated; the club solid; thorax convex, scarcely margined; head hid under the thorax, which is inflexed.

The insects of this genus are very fertile; both the larva and perfect insect eat the roots and wood of trees, and are sometimes most destructive to woods.

1. Bof.

**BOSTRICHUS.**

1. *Bostrichus Capucinus*. Black ; the elytra and abdomen red ; the thorax hollowed on the fore part.

*Inhabits* Europe.

A pretty rare insect ; found on the dead or dying trunks of trees ; the thorax is downy and set with small hairs, which, with a magnifier appear curled. It so hides its head under the thorax as to appear decapitated.

2. *Bostrichus Typographus*. Brown ; hairy ; the elytra striated, hollowed before, and dentated as if bitten.

*Inhabits* Europe, America, &c. B.

Found in the barks of trees, particularly of Firs. Is very voracious and fertile ; making a canal between the bark and wood, from which many smaller and nearly parallel ones shoot out on both sides ; it varies in size and colour according to its age ; it is very tenacious of life.

3. *Bostrichus Scolytus*. Smooth and blackish ; elytra intire and truncated ; the abdomen hollowed, the forehead villous and of an ash-colour.

*Inhabits* France, &c. B.

Is found under the bark of trees, particularly elms ; among which in England it often commits great devastation.

4. *Bostrichus piniperda*. Black, and somewhat villous ; the elytra light black ; the tarsi red.

*Inhabits* Europe. B.

Is found on the lower branches of the Fir tribe, which it perforates and destroys ; the colours of the elytra vary.

**GEN. V. MELYRIS.** The lip clavated and emarginated ; antennæ perfoliated through their whole length ; the maxilla acute, with one dent.

*Melyris viridis*. Of a green colour ; the elytra with three elevated lines.

*Inhabits* the Cape of Good Hope.

Varies in colour, being sometimes blue ; the head like that of a *Dermestes* inflected under the thorax. Found upon flowers.

**GEN. VI. PTINUS.** Antennæ filiform ; the last articulations the largest ; thorax nearly round, not margined, receiving the head under it.

## PTINUS.

\* *With clubbed palpi.* Anobia, Fabr.

1. *Ptinus pertinax.* Brown, all of one colour.

*Inhabits Europe.* B.

It destroys furniture, particularly that made of oak; when taken, it contracts itself and remains motionless as if it were dead, nor can any torture force it to flight. It is extirpated by the *Attelabus formicarius*.

2. *Ptinus mollis.* Of a brick colour; the eyes brown.

*Inhabits Europe.* B.

The three last articulations of the antennæ are longer, but not thicker than the rest; it is destructive to dried plants, which, in order to be freed from it, must be exposed to the heat of an oven. The larva endures the greatest cold.

\*\* *With filiform palpi.* Ptini.

3. *Ptinus Fur.* Of a brick colour; the thorax with 4 dents; the elytra with two white fasciæ.

*Inhabits Europe.* B.

This is a most destructive insect in museums. It consumes plants, insects, birds, skins, books, and furniture, and even snuff; for it is not to be kept off by strong-smelling substances, such as Camphor. It is fond of cold and moisture, and is expelled by heat and dryness; it is killed by arsenic and alum, but more certainly by corrosive sublimate. It resembles a *Dermestes* in habit, manners, and metamorphosis, and a *Cerambyx* in the lateral dents on the thorax. The female has no wings; the larva is soft and hairy, with six feet; the segments on the back raised; the pupa resides in a glutinous ball.

4. *Ptinus Latro.* Of a brick colour, not spotted; the thorax with two dents.

*Inhabits Strasburg.* B.

Antennæ filiform; the length of the body; thorax narrow; the elytra with punctured striæ.

GEN. VII. HISTER. Antennæ clavated; the club solid; the lowest articulation compressed and bent; the head retractile within the body; the mouth formed like a forceps; the elytra shorter than the body; the fore-tibiæ dentated.

The insects of this genus are found in dung, in carcases, and shambles; some species live under the bark of decaying trees.



**HISTER.**

trees. They are found in spring, summer, and a great part of the year. Like the Dermestides and Byrrhi, they contract, when touched, and counterfeit death.

1. *Hister unicolor*. Black; the elytra obliquely striated.

*Inhabits* Europe and America. B.

It varies in size. The whole body is black and shining; the head small and sunk under the thorax. It is found in sand, in the earth, and in dung.

2. *Hister bimaculatus*. Black; the elytra red at the extremities.

*Inhabits* Europe. B.

The elytra are striated, with each an oval spot towards the margin reaching to the end.

3. *Hister aeneus*. Of a bronze colour; the elytra striated at the base, and dotted at the apex.

*Inhabits* France, &c. B.

This is somewhat less than the first species, but pretty much resembles it. The body is black, more or less of a bronze colour, and very brilliant.

4. *Hister striatus*. Black; the thorax and elytra striated.

*Inhabits* England.

**GEN. VIII. GYRINUS.** Antennae cylindrical; the maxilla horny and very acute; four eyes, two above and two below.

*Gyrinus Natator*. Somewhat striated.

*Inhabits* Europe. B.

Frequent in lakes and still waters; running swiftly in circles on the surface, and when it dives carrying along with it a bubble of air, which appears like quicksilver. The female deposits her eggs in rows on the leaves of water grasses, which are hatched in three weeks; the larva is at first transparent, afterwards dark coloured, with a light fascia. About August it creeps to the tops of water plants, and weaves about itself a web like paper, in which it turns a Pupa. These insects live in society, and often in their brisk motions strike against one another. In the evenings they betake themselves to still places, under bridges, or under the roots of trees which grow at the water's edge.

GEN. IX. BYRRHUS. Antennae clavated; the club perfoliated; palpi equal and a little clavated; the maxilla and lip bifid.

The Birrhi destroy skins and other animal matters in a state of decomposition. When touched they apply their antennæ and feet so close to the body, remaining at the same time motionless, that they resemble a seed rather than an animated being.

1. *Byrrhus Pilula*. Brown; the elytra with black interrupted striae.

*Inhabits Europe.* B.

Is found in sandy soils, in fields, and by the sides of roads. It is of an oval shape; sometimes of a black colour, which arises from the minute brown hairs that cover the upper part of the body having been rubbed off.

2. *Byrrhus varius*. Black; thorax of a bronze colour, elytra brown; with three abbreviated striae spotted with black and green.

*Inhabits France.* B.

Of the size and figure of the former species.

GEN. X. ANTIIRENUS. Antennae clavated; the club solid; palpi unequal and filiform; the maxilla membranaceous, linear, and bifid; the lip intire.

These insects are found on flowers; they are small, but in general prettily coloured. They contract on the apprehension of danger, and appear as if dead. Their larvæ are found in carcasses, skins, and dried animal substances, and they attack the insects and other objects in museums. They pass nearly a year in that state before changing into a Pupa; the perfect insect is found chiefly in spring.

1. *Anthrenus Scrophulariae*. Black; the elytra spotted with white; the future of a blood-red colour.

*Inhabits Europe.* B.

Found on flowers, particularly of the *Scrophularia*. The colours of this, and of the other species, are owing to small triangular scales, similar to those on the wings of Butterflies, which are easily rubbed off, when the insect appears quite black.

2. An-

**ANTHRENUS.**

2. *Anthrenus Verbasci*. Black; the elytra with three white waved fasciæ.

*Inhabits* Europe. B.

Found on the flowers of the Verbascum. The antennæ and head black; the thorax obscurely reddish.

**GEN. XI. SILPHA.** Antennæ clavated; the club perfoliated; the elytra margined; the head projecting; the thorax flattish and margined.

The Silpha live in dark and retired places, and those which conceal carcases or the excrements of animals on which they feed; they have generally a fetid smell, and when taken, they discharge by the mouth or the anus, a drop of black liquor of a very disgusting odour; this liquor serves to accelerate the putrefaction of the matters on which they feed. Their larvæ live in the earth in dung-hills and dead carcases; they have six short feet; the head is small, armed with strong jaws; they undergo their transformations under ground.

1. *Silpha Vespillo*. Oblong and black; the clypeus orbicular and unequal; the elytra marked with two ferruginous fasciæ.

*Inhabits* Europe and America. B.

This species is subject to vary much; in America it is double the size that it is with us. It is infested with Acari; it flies very swiftly with its elytra erect. The elytra are shorter than the abdomen. It feeds on carcases, and a small dead animal is soon visited by a number of Silphæ, which join in burying it after they have deposited their eggs in its body. Thus a mole or a mouse is often buried by the industry of four or five of them in the space of four and twenty hours. They scoop out the earth all round and below the animal, which gradually sinks down, and while the agents are invisible, we see the effects by the disappearance of the carcase. They undergo their changes in the earth.

2. *Silpha rufifrons*. Oblong, smooth, and black; the forehead, the feet, and two spots on the elytra, of a ferruginous colour.

*Inhabits* England.

3. *Silpha atrata*. Black, the elytra dotted; with three smooth elevated lines; the thorax intire.

*Inhabits* Europe. B.

Found

## SILPHA.

Found in fields and high-ways; but chiefly among animals and corrupted matter.

4. *Silpha thoracica*. Black, the elytra dark, with elevated line; the thorax brick-coloured.

*Inhabits* Europe. B.

Found in carcases. Of an oval and flat shape; the elytra truncated, and having yellow hairs.

5. *Silpha quadripunctata*. Black; elytra pale, with black point at the base and in the middle; the thorax emarginated.

*Inhabits* Europe. B.

Is found in England, particularly in oak woods.

6. *Silpha sinuata*. The thorax rough and emarginated; the elytra with three elevated lines, sinuated at the apex.

*Inhabits* Germany. B.

The elytra are larger than the abdomen, with an angle at the apex. It very much resembles the foregoing species.

7. *Silpha rugosa*. Blackish; the elytra wrinkled with three elevated lines; the thorax rough, with a line behind.

*Inhabits* Europe and Siberia. B.

A very common species. The elytra have five lines if you count the lateral striae; the clypeus in some specimens is covered with a bluish down, and tuberculated with prominent points. It is generally found in putrid substances and sometimes in the fields. The larva is smooth, and consists of twelve incisures, besides the head and is black; the head small.

8. *Silpha ferruginea*. Of a rust-colour; the elytra with six elevated lines; the thorax emarginated and striated.

*Inhabits* Europe. B.

The thorax is as broad as the elytra, and much broader than the head: the margin of the thorax paler than the elytra, which are striated and dotted between the striae; the eyes are black. It is frequently found in the mud in March.

SILPHA.

9. *Silpha pulicaria*. Black and oblong ; the elytra abbreviated ; the abdomen acute.

*Inhabits* Europe. B.

A very small species ; found on flowers, chiefly those of the umbelliferæ.

10. *Silpha minuta*. Black, the elytra striated ; the feet of the same colour.

*Inhabits* England.

11. *Silpha fmetaria*. Black, without spot, the elytra very smooth.

*Inhabits* England.

This is so small a species that it is with difficulty its head, antennæ, or feet, can be observed ; it is found in Cow-dung.

12. *Silpha scarabaeoides*. Ovate and black ; the elytra with two reddish spots.

*Inhabits* Europe. B.

Very like the *Scarabæus quisquilius*. Of the size of a grain of rice. The feet set with rigid setæ.

GEN. XII. NITIDULA. Antennæ clavated ; the club solid ; the elytra marginated ; the head prominent ; the thorax flattish and marginated.

In the former editions of the *Systema Naturæ*, the insects of this genus were included in the genus *Silpha*.

\* *With a square lip.*

1. *Nitidula aquatica*. Brown ; the thorax, which is rough, and the elytra, of a dark bronze colour.

*Inhabits* Europe. B.

A small species, found in stagnant waters among *Conservæ*. The elytra have four elevated fasciæ. The size of a house-bug.

2. *Nitidula minuta*. Brown ; the thorax rough and bronzed ; the elytra pale.

*Inhabits* England. B.

Like the former, and found in the same places, but only one third of its size.

\*\* *With*

## NITIDULA.

**\*\* With a cylindrical lip.**

3. *Nitidula bipustulata*. Ovate and black; a red dot on the elytra.

*Inhabits Europe.* B.

A small species found in carcases and dried animal substances. The feet are of a reddish-brown colour.

4. *Nitidula discoidea*. Black, the thorax margined; the disc of the elytra ferruginous.

*Inhabits France, &c.* B.

A minute species. The elytra are of a tawny yellow in the middle; the edges and extremities black.

5. *Nitidula aenea*. Of a green bronze-colour; the thorax margined; the antennæ and feet black.

*Inhabits France, &c.* B.

A minute species; the thorax and elytra finely dotted and terminated by a distinct margin. Found on flowers.

**GEN. XIII. OPATRUM.** Antennæ moniliform; growing thicker at the end; elytra margined; head prominent; thorax flattish and margined.

*Opatrum fabulosum*. Brown; the elytra dentated with three elevated lines; the thorax emarginated.

*Inhabits Europe and North America.* B.

This is the *Silpha fabulosa* Lin. The body is of a dull ash-colour, not shining; the greater part of the head is hid under the clypeus. It is commonly found in the fields, and sometimes in carcases, the general abode of its larva.

**GEN. XIV. TRITOMA.** Antennæ clavated; the club perfoliated; the foremost palpi securiform.

*Tritoma bipustulatum*. Black, the elytra with a scarlet spot on the sides.

*Inhabits France.* B.

The body is elongated. It is found on the trunks, and under the bark of trees.

**GEN. XV. CASSIDA.** Antennæ moniliform; elytra margined: head hid under the flat clypeus of the thorax.

1. *Cassida*

CASSIDA.

1. *Cassida viridis*. Green.

*Inhabits* Europe. B.

Found frequently on thistles, and on the verticillated plants. Body oval; convex above; flat below. The elytra project over the sides, and totally cover the whole body, so that no part of it is seen. The larva has six feet, and feeds on the thistle; it is broad, short, and depressed with acute spines on the sides; its tail is recurved, and terminates in a sort of fork, between the prongs of which is the anus. By this means the excrements of the animal are retained on the fork, and accumulated, so as to form a parasol; and when they are dry they are thrown off, and fresh substituted. The larva often changes its skin, the fragments of which are sometimes found in the above mentioned mass. The Pupa is broad, flat, and almost oval, surrounded with a number of fringe-like appendages, and before with an arched band. It is of a pale green, and found on thistles. In fifteen days the perfect insect appears.

2. *Cassida nebulosa*. Pale and clouded; with brown spots.

*Inhabits* Europe. B.

Found also on thistles. Like the last, but only half as large. The clypeus is like a crescent, quite smooth, and without any spot; elytra rough and striated with sunk dots, the striae crooked and waving.

3. *Cassida nobilis*. Grey, the elytra with a bright shining blue line.

*Inhabits* England.

Found on thistles and stellated plants. It is like the *viridis*, but the elytra are marked with blue longitudinal lines, which disappear when the insect dies, but they revive when it is put into warm water.

4. *Cassida maculata*. Green, the elytra thinly, but the dorsal suture thickly marked with black spots.

*Inhabits* Europe. B.

This is perhaps but a variety of the *viridis*.

5. *Cassida cruentata*. Bright green above, with a bright sanguineous mark on the elytra near the scutellum; beneath black; tibia and tarsi light brown.

*Inhabits* Europe. B.

This species is figured and described in Donovan's *Insects*, Plate 63. fig. 2. 3. where it is said to differ from the *viridis*  
Vol. II. F in

**CASSIDA.**

in being smaller, of a darker green, and not fading like the former after death to a dirty brown. Found in May on verticillated plants and thistles.

**GEN. XVI. COCCINELLA.** The antennæ clavated; the club solid; the foremost palpi securiform, the hinder filiform; body hemispherical; thorax and elytra margined; the abdomen flat.

This genus comprehends the insects commonly called in England Lady Cow, or Lady bird. The larvæ feed on the Aphides. There are upwards of 150 known species, and the genus is divided into 4 sections.

\* *The elytra red or yellow, with black dots.*

1. *Coccinella annulata.* Coleoptra red, with a black crescent-like mark.

*Inhabits* Germany, &c. B.

The thorax is black, pale on the edges; the elytra have a black fascia on the middle, and behind that another, which, at the ends is connected with the former.

2. *Coccinella bi punctata.* Coleoptra \* red; with two black dots.

*Inhabits* Europe. B.

The abdomen, antennæ, feet, and all below black; thorax black, with a white spot on the side; two small white dots at the base of the thorax, and other two at the insertion of the antennæ. Frequent in gardens and woods; it lives on Aphides.

3. *Coccinella quinquepunctata.* Coleoptra red; with 5 black dots.

*Inhabits* Europe. B.

In the middle of each elytron is a black spot, and another smaller lower down and more outward; at the origin of the elytra is another spot, part of it on the one, and part on the other.

4. *Coccinella*

\* Used by Linnæus for both elytra, e. g. elytra with eight spots, means eight spots on each elytron; coleoptra with eight spots, means eight spots on both elytra.



## COCCINELLA.

4. *Coccinella trifasciata*. Coleoptra red; with three black fasciæ.

*Inhabits* Europe. B.

Found in gardens. Thorax black, white at the sides; two white dots at the insertion of the antennæ; the fascia next the thorax joins both elytra; the other two are interrupted.

5. *Coccinella septempunctata*. Coleoptra red; with 7 black dots.

*Inhabits* Europe. B.

A very common species. On each elytron three black spots; and one at the base of the elytra, and joining them; black, but white before. The larva ash-coloured, with black and white spots; the pupa yellowish, attached by the anus.

6. *Coccinella novempunctata*. Coleoptra red; with nine black dots.

*Inhabits* Europe. B.

On each elytron are three large black spots, and a smaller one lower down; a spot at the origin of the elytra, is common to both. Found in gardens and on the Juniper.

7. *Coccinella 13-punctata*. Coleoptra yellow, with 13 black dots.

*Inhabits* Europe. B.

In each elytron there are six spots, of which two in the middle touch each other; an odd one connects the elytra at the base.

8. *Coccinella 14-punctata*. Coleoptra yellow; with 14 black dots; some of them touching.

*Inhabits* Europe. B.

Among the smallest of the genus. The thorax is yellow spotted with black. The order of dots on the elytra is transversely 3. 3. 1. or longitudinally 2. 2. 3.

9. *Coccinella 16-punctata*. Coleoptra yellow; with 16 black dots.

*Inhabits* Italy, Germany, &c. B.

Oblong, whitish, the head marked with 4 dots; thighs black, the tibiae yellow.

10. *Coccinella 22-punctata*. Coleoptra yellow; with twenty-two black dots.

*Inhabits* Europe. B.

## COCCINELLA.

A small species. Each elytron has nine distinct spots, besides two which are not very conspicuous; the thorax has seven spots, of which the undermost is the largest. Viewed from below, the margin of the coleoptra projects, with a black point in the middle on both sides.

11. *Coccinella conglobata*. Coleoptra yellowish; with many black dots almost touching.

*Inhabits* Europe. B.

Is perhaps but a variety of the following species.

12. *Coccinella conglomerata*. Coleoptra yellowish; with many black contiguous dots.

*Inhabits* Europe. B.

Head yellow; thorax yellow before; black behind. The spots on the elytra run into one another, and form a sort of cross.

**\*\*** *The elytra red or yellow; with white spots.*

13. *Coccinella 14-guttata*. Coleoptra red; with fourteen white dots.

*Inhabits* Europe. B.

Antennæ and eyes black. The spots on the elytra form four lines, the first line contains two spots, the second six, the third four, and the last two. Found on willows.

14. *Coccinella oblongo-guttata*. Coleoptra red; with white lines and dots.

*Inhabits* Europe. B.

Thorax red, white at the edges; each elytron is marked with two longitudinal white lines, interrupted in the middle.

**\*\*\*** *The coleoptra black, with red spots.*

15. *Coccinella bi-pustulata*. Coleoptra black, with two red dots; the abdomen of a blood-red colour.

*Inhabits* Europe. B.

Of an orbicular form; black and shining; the margin projecting. On each elytron, in the middle, is a red spot, often as if composed of three. The spot is sometimes yellowish.

16. *Coccinella sex pustulata*. Coleoptra black; with six red dots.

*Inhabits* Europe. B.

Found in gardens. Elytra shining, with three red spots

**COCCINELLA.**

on each, of which that next the thorax is the largest; the middle one is nearer the inner, than the outer margin.

\*\*\* *Coleoptra black; with white and yellow dots.*

17. *Coccinella 14-pustulata*. *Coleoptra black; with fourteen yellow dots.*

*Inhabits Europe. B.*

A small species; found in trees, and in gardens. There are seven spots on each elytron, ranged by pairs, with a single one at the inferior extremity.

**GEN. XVII. ALURNUS.** *Antennæ filiform; palpi fix, very short; maxilla horny and arched.*

*Alurnus groffus*. Black; thorax scarlet; elytra yellow.

*Inhabits South America, and India.*

**GEN. XVIII. CHRYSOMELA.** *Antennæ moniliform. Palpi fix, thickest at the extremity. Thorax margined, but not the elytra. Body for the most part ovate.*

The insects of this genus are for the most part nearly hemispherical and adorned with shining and splendid colours. They live on leaves, but do not eat the nerves. Their larvæ are in general of an oval shape, somewhat elongated and soft, with six feet near the head. The last joint of their feet, or the tarsi, consists of four articulations. The genus contains 270 species, and is divided into two sections.

\* *The thighs of the hind legs equal.*

1. *Chrysomela Bankii*. Bronze above, testaceous below.

*Inhabits Portugal and Calabria. B.*

A rare insect in England; but found in May on a thistle. It differs from the *bicolor*, in the colour of the under side, which in that is violaceous.

2. *Chrysomela Tanaceti*. Black and punctured; the antennæ and feet black.

*Inhabits Europe. B.*

## CHRYSOMELA.

One of the largest of the genus. It is black but not shining. Found on the Tansy.

3. *Chrysomela Graminis*. Of a shining greenish blue colour; the antennæ of the same colour with the feet.

*Inhabits* Europe. B.

One of the largest of the genus. The thorax and elytra are finely punctured. The larvæ of this insect are found on the labiated plants, but chiefly on the grasses, and sometimes lay waste whole meadows.

4. *Chrysomela Alni*. Of a violet colour; the elytra irregularly punctured; the feet and antennæ black.

*Inhabits* Europe. B.

Found upon the Alder. Like the following species, but larger, and the punctures of the elytra not in striae, but scattered.

5. *Chrysomela Betulae*. Of a violet colour; the elytra with punctured striae.

*Inhabits* Europe. B.

Found on the Birch, feeding on the under surface of the leaf. The belly, feet, and antennæ black; the elytra marked with striae, which are hardly observable, with very small excavated dots.

6. *Chrysomela haemoptera*. Of a violet colour; the plantæ and wings red.

*Inhabits* Europe. B.

Found on the Hypericum. Blackish above, bluish below; the antennæ black.

7. *Chrysomela cerealis*. Of a shining brassy colour; the thorax with three and the coleoptra with five blue lines.

*Inhabits* the South of Europe. B.

Found on Corn and on Broom. Of middle size, violet-coloured below, seldom wholly purple.

8. *Chrysomela fastuosa*. Of a golden colour; the coleoptra with three blue lines.

*Inhabits* Europe. B.

Found on the *Lamium album*, the Nettle and the Rubi; the middle line on the coleoptra forms the margins of the suture.

9. *Chrysomela*

CHRYSOMELA.

9. *Chrysomela vitellina*. Of a bluish green colour.

*Inhabits Europe.* B.

Found on Willows and Poplars, eating the leaves on the under-side. The larvæ when they feed are arranged in parallel lines.

10. *Chrysomela Polygmi*. Blue; the thorax, thighs and anus red.

*Inhabits Europe.* B.

Found on the *Polygonum aviculare* and the *Rumex acetosa*; the feet are sometimes red and the plantæ black. Immediately before the female has deposited her ova, the abdomen swells beyond the elytra.

11. *Chrysomela staphylæa*. Wholly of a dark brick colour.

*Inhabits Europe.* B.

Among the largest of the European species. In colour like the seed of the *Staphylæa*.

12. *Chrysomela polita*. Thorax gilded; the elytra red.

*Inhabits Europe.* B.

Found on the Willow and the Poplar. The head and thorax are splendid. The elytra are of a dull red or brown colour without spots at the apex.

13. *Chrysomela Populi*. Thorax bluish; elytra red, black at the apex.

*Inhabits Europe.* B.

Found on the Aspen; among the largest of the genus. The elytra are sprinkled with minute excavated dots, and have a very small black spot at the apex: the margin is inflexed and closely invests the body. The larva commits great ravages on the leaves of the Poplar, leaving nothing but the nerves. It is variegated with black and white, and when touched it discharges a very fetid oily matter from a double row of tubercles on its sides.

14. *Chrysomela Boleti*. Black; the elytra with three yellow waving fasciæ.

*Inhabits Europe.* B.

Found on the *Boletus* of trees. Body pretty large, and nearly hemispherical and smooth. One of the fasciæ is at the base of the elytra; the last is the smallest and at the apex.

15. *Chrysomela*

## CHRYSOMELA

15. *Chrysomela sanguinolenta*. Black; the elytra of a blood-red colour at the outer margin.

*Inhabits* Europe. B.

Found on Willows. Body pretty large and shining. Feet black.

16. *Chrysomela marginella*. Dark blue; the thorax and elytra with yellow margins.

*Inhabits* Europe. B.

Found in June on the *Ranunculus acris*. The elytra with dotted striz, and sometimes of a dark green colour.

17. *Chrysomela litura*. Reddish; the elytra with the future and a longitudinal line black.

*Inhabits* Germany, &c. B.

Found on the Broom. Elytra striated with dots; the longitudinal line does not extend either to the base or to the apex.

18. *Chrysomela coccinea*. Thorax red and marginated, with a black spot; the elytra of a blood-red colour, with two black spots.

*Inhabits* Europe. B.

Found on the Hazel. Has been found in England but rarely.

19. *Chrysomela 20-punctata*. Oblong and of a greenish bronze colour, the margins of the thorax white; the elytra white with ten bronze spots.

*Inhabits* England.

Head black; the elytra striated.

20. *Chrysomela anglica*. Bluish black; the elytra of a blackish bronze colour with punctured striz; the wings red.

*Inhabits* England.

Found on the *Hypericum perforatum*.

21. *Chrysomela vernalis*. Black; the head, thorax, elytra, and feet olive; the elytra with a longitudinal stria and future black.

*Inhabits* England.

Found early in Spring on the sand.

- \*\* *The thighs of the hind legs strong and thick; formed for leaping.*

22. *Chrysomela biliturata*. Black; elytra yellowish brown,

**CHRYSOMELA.**

brown, with a longitudinal black stripe extending from the base nearly to the apex.

*Inhabits* England.

From Donovan Plate 99. Found on the Hornbeam in May. Antennæ nearly the length of the body.

23. *Chrysomela oleracea*. Of a bluish-green colour.

*Inhabits* Europe. B.

Found on plants, particularly of the tetradymanious kind, the seminal leaves of which it destroys; but may perhaps be prevented if the seeds of those plants, before being sown, are immersed in a decoction of tobacco. The largest of this section. Antennæ black.

24. *Chrysomela Hyoscyami*. Of a bluish-green colour; feet testaceous; the hinder thighs violaceous.

*Inhabits* Europe. B.

Found on the Henbane and Cabbage. A small species, shining, convex and ovate; the tibiae ferruginous.

25. *Chrysomela quadripustulata*. Black; the coleoptera with four red dots.

*Inhabits* France, &c. B.

Found in gardens. The base of the antennæ and the feet, except the hinder thighs, are of the same colour with the points of the elytra.

26. *Chrysomela anglicana*. Black, the elytra and tibiae pale.

*Inhabits* England.

27. *Chrysomela dorsalis*. Black; the thorax and margin of the elytra pale.

*Inhabits* England.

28. *Chrysomela exoleta*. Ferruginous: the elytra striated.

*Inhabits* Europe. B.

Found on the flowers of the Echium, which, it eats; a small species: of one uniform colour.

29. *Chrysomela nitidula*. Green and shining; head and thorax of a gold colour; the feet ferruginous.

*Inhabits* Europe. B.

Found on the Willow; the elytra bluish and striated: it does not leap: it varies much.

30. *Chrysomela nigræ*. Of a greenish bronze colour; the feet black.

*Inhabits* England.

## CHRYSOMELA.

31. *Chrysomela tabida*. Pale with black eyes.

*Inhabits England.*

32. *Chrysomela nemorum*. With yellow elytra; the whole margin black.

*Inhabits Europe. B.*

Found on the Pulmonaria, Dentaria, Cardamine, and many other plants. The body oblong, black, and not shining. It varies in size.

GEN. XIX. CRYPTOCEPHALUS. Antennæ filiform. Palpi 4. Thorax margined, but not the elytra. Body nearly cylindrical.

The insects of this genus very much resemble those of the preceding, in form and manners, and were accordingly in the former editions of the *Systema Naturæ* arranged as *Chrysomelæ*. Fabricius separates it further into several genera, which Gmelin makes only subdivisions or sections.

\* *With equal filiform Palpi.*

1. *Cryptocephalus quadripunctatus*. Black; elytra red; with two black dots, the antennæ short and serrated.

*Inhabits Europe. B.*

Found on the Hazel. The larva resides in a sort of sack, which is ovate, rough, and obliquely truncated before.

2. *Cryptocephalus sericeus*. Bluish-green, with black antennæ.

*Inhabits Europe. B.*

Found on Willows. Of a silky or velvety appearance, and when viewed with a magnifier, dotted with excavated points which touch one another; the elytra are wide behind; the feet black.

3. *Cryptocephalus cervinus*. Of a livid colour, the feet brown.

*Inhabits Europe. B.*

Body oblong; black below; the colour of the back is formed by very minute hairs. Thorax nearly ovate, transverse behind and convex. Elytra with a little margin.

4. *Cryptocephalus angustatus*. Thorax and elytra of a dull red, black in the middle.

*Inhabits England.*

5. *Cryptocephalus*



**CRYPTOCEPHALUS.**

5. *Cryptocephalus pallidus*. Of a pale colour; the head and the apex of the elytra brown.  
*Inhabits* England.
6. *Cryptocephalus quadrifasciatus*. Obovate and black; the elytra striated.  
*Inhabits* England.  
Found in sandy soils.
7. *Cryptocephalus calvariensis*. Ovate, and of an ash-colour; the elytra with a black band and a black line at the base.  
*Inhabits* Europe. B.  
Found on Willows, the Alder and the Elm. Of an elongated shape.
8. *Cryptocephalus cantharoides*. Of a violet colour; the head, thorax, and feet red.  
*Inhabits* England.
9. *Cryptocephalus duodecimpunctatus*. Red, the thorax cylindrical, the elytra with six black dots.  
*Inhabits* Europe. B.  
Found on the Asparagus. The antennæ black, the thorax not spotted.
10. *Cryptocephalus Cyanella*. Blue, the thorax cylindrical, the sides gibbous.  
*Inhabits* Europe. B.  
Found on plants. Body shining, antennæ alone black.
11. *Cryptocephalus subspinosus*. Black; the head, the thorax, which is somewhat spiny, and the feet red.  
*Inhabits* England.
12. *Cryptocephalus Asparagi*. Thorax red, with two white spots; coleoptra yellow, with a cross and four dots black.  
*Inhabits* Europe. B.  
Found on the Asparagus. A common and very pretty insect; of an elongated shape; the antennæ black, the thorax cylindrical, with two black spots; the cross and spots on the thorax often dark green. The larva smooth and of a blackish-brown colour.
13. *Cryptocephalus Pbellandrii*. Black, the margin of the thorax and two lines on the elytra yellow.  
*Inhabits* Europe. B.

## CRYPTOCEPHALUS.

Found on the *Phellandrium aquaticum*, on the roots of which the larva feeds. Of an oblong shape; the antennæ clavated and black, the tibiae and interior part of the thighs yellow.

14. *Cryptocephalus Crataegi*. Red, the elytra with a black longitudinal line and a dot.

*Inhabits* England.

Found on the *Cratægus oxyacantha*: black underneath.

\*\* *With unequal palpi; the foremost are shaped.*

15. *Cryptocephalus elongatus*. Black; the thorax red and villous.

*Inhabits* Europe. B.

Longer, and more slender than the rest of the genus; the thorax semi-cylindrical, and very narrow.

16. *Cryptocephalus glabratus*. Smooth, the thorax reddish; the elytra yellow.

*Inhabits* England.

GEN. XX. *HISPA*. Antennæ cylindrical, near each other at the base, and placed between the eyes; palpi fusiform; thorax and elytra often aculeated.

1. *Hispa cornigera*. Antennæ ferrated; thorax red; elytra blue; head with two horns.

*Inhabits* England.

2. *Hispa pectinicornis*. Brown; antennæ pectinated; feet yellowish.

*Inhabits* Europe. B.

Found in filth, and in the leaves of the Hazel.

3. *Hispa flabellicornis*. Black; antennæ pectinated; elytra striated.

*Inhabits* England.

GEN. XXI. *BRUCHUS*. Antennæ filiform; palpi equal, and filiform; lip acuminate.

1. *Bruchus Pisi*. Elytra black, with white spots; the extremity white, with two black dots.

*Inhabits* North America.

This

**BRUCHUS.**

This insect does incredible mischief to the fields of peas, and even to fruit-trees. It has also made its appearance in the South of Europe.

2. *Bruchus scabrosus*. Black; elytra red, with elevated striae; and with black irregular dots.

*Inhabits* Europe. B.

Found on the Horse Chestnut.

**GEN. XXII. PAUSUS.** Antennæ biarticulated, and clavated; the club solid and hooked.

*Pausus microcephalus.*

*Inhabits* the East.

Of this singular insect, there is yet discovered but this species. It is wholly black, of the size of the *Dermestes lardarius*; the head is very small; the thorax narrow; the elytra truncated; as is, in some measure, the abdomen.

**GEN. XXIII. ZYGIA.** Antennæ moniliform; palpi unequal, filiform; lip elongated, membranaceous; maxilla with one dent.

*Zygia oblonga.*

*Inhabits* the East.

Of this genus there is likewise but one species.

**GEN. XXIV. ZONITIS.** Antennæ setaceous; palpi four, filiform, shorter than the maxilla, which is intire; lip emarginated.

*Zonitis chrysomelina.* Yellow; the elytra with a black dot in the middle, and at the apex.

*Inhabits* the East, Egypt, &c.

**GEN. XXV. APALUS.** Antennæ filiform; palpi equal, filiform; maxilla horny, with one dent; lip membranaceous, truncated and intire.

*Apalus bimaculatus.*

*Inhabits* Sweden.

The

## APALUS.

The *Meloe bimaculatus* of the former editions of the *Systēma Naturæ*. The elytra are yellow, with a black spot behind.

GEN. XXVI. BRENTUS. Antennæ moniliform; exerted beyond the middle of the rostrum; mouth a projecting, straight, cylindrical rostrum.

*Brentus Anchorago*. Linear; the elytra with yellow striæ; thorax elongated.

*Inhabits* South America, and India.

GEN. XXVII. CURCULIO. Antennæ clavated; situated on a horny prominent rostrum; four filiform palpi.

This is a very numerous genus, containing 606 species. It is divided into several sections.

*Long snouted; thighs simple.*

1. *Curculio palmarum*. Black; thorax flat above; the elytra abbreviated, and striated.

*Inhabits* India.

This is among the largest species of the genus. It is often brought in collections from China. It lives on the palm trees; and its larvæ are considered as a delicacy.

2. *Curculio alliarie*. Wholly of a violet colour.

*Inhabits* Europe. B.

Found on the stalks of the *Erysimum alliarum*, which it perforates. Elytra striated with excavated points.

3. *Curculio cyaneus*. Black; the elytra violaceous; the scutellum white.

*Inhabits* Europe. B.

Found on Willows, and the Mallow. Thorax cylindrical; the hinder part of the body rounded.

4. *Curculio Malvae*. Grey, the elytra and feet testaceous.

*Inhabits* England.

Found on Mallows; the rostrum and abdomen black.

5. *Curculio nigrirostri*. Green; the snout black.

*Inhabits* England.

**CURCULIO.**

6. *Curculio rufirostris*. Black; the half of the rostrum and feet red.

*Inhabits* England.

7. *Curculio salicariae*. Black; the base of the antennae, the disc of the coleoptra, and the tibiae, of a brick colour.

*Inhabits* England.

Found on the *Lythrum salicaria*; a small species.

8. *Curculio badensis*. Black; the feet light black.

*Inhabits* Europe. B.

Thorax somewhat smooth and ovate; the elytra slightly striated; the thighs clubbed.

9. *Curculio aequatus*. Of a bronze colour; the elytra red; the rostrum black and elongated.

*Inhabits* Germany, &c. B.

Found on the Hazel in May; varies in size and colour.

10. *Curculio Cerasi*. Black; the antennae ferruginous; the thorax with two tubercles.

*Inhabits* Europe. B.

Found on the Cherry.

11. *Curculio acridulus*. Of a light black colour; the abdomen ovate.

*Inhabits* Europe. B.

Found on the plants of the Class Tetradymania. The elytra striated.

12. *Curculio purpureus*. Of a shining purple colour; rostrum very long.

*Inhabits* Europe. B.

13. *Curculio granarius*. The Weevil. Of a light black colour; thorax punctured, of the same length with the elytra.

*Inhabits* Europe. B.

A small species; found in granaries, where corn has been long kept; a most destructive insect; said to be extirpated by the *Isatis*, *Hyoscyamus*, *Sambucus*, and *Thlaspi*.

14. *Curculio dorialis*. Elytra red; the tibiae black.

*Inhabits* Germany. B.

Found on the *Ranunculus Ficaria*. Small species. Elytra striated; thighs black; tibiae yellow.

## CURCULIO.

15. *Curculio Pini*. Elytra testaceous ; with clouded fasciæ.  
*Inhabits* Europe. B.  
 Found on the bark of the Pine. Thorax with small white dots hardly conspicuous ; elytra reddish with ferruginous fasciæ.
16. *Curculio Equiseti*. Thorax smooth ; elytra black and muricated ; with two dots, and the apex white.  
*Inhabits* England.  
 Found on the *Equisetum arvense*.
17. *Curculio æneus*. Black, with bronze elytra.  
*Inhabits* England.
18. *Curculio scaber*. Ash-coloured ; with red feet, the elytra rough.  
*Inhabits* Europe. B.  
 Found on the Nettle.
19. *Curculio venustus*. Brown ; with white lines on the thorax and elytra ; the feet testaceous.  
*Inhabits* England.  
 A small species.
20. *Curculio Viscariae*. Of an ash-colour, nearly round ; the thorax and elytra of a greenish ash-colour.  
*Inhabits* Europe. B.  
 Found on the flowers of the *Lychnis viscaria*. Small ; the head and feet black.
21. *Curculio quinquemaculatus*. Grey, the coleoptra with five white spots.  
*Inhabits* Europe. B.
22. *Curculio pericarpus*. Nearly globular, and clouded ; white at the base of the future.  
*Inhabits* Europe. B.  
 Found in the pericarpium of the *Scrophularia* ; feet testaceous.
23. *Curculio Capreae*. The coleoptra with two white abbreviated and waved fasciæ.  
*Inhabits* England.  
 Found on the *Salix caprea*. A small species.

24. *Curculio*

CURCULIO.

**Curculio parvulus.** Cylindrical, and somewhat ash coloured; the elytra pointed.

*Inhabits Europe. B.*

Found on the aquatic umbelliferous plants, particularly the *Phellandrium*; the larva lives within the stalk, and often lies concealed under the water, and is said to be the cause of the Paraplegia in Horses.

**15. Curculio angustatus.** Cylindrical and black; elytra obtuse and punctured.

*Inhabits England.*

Not common. The elytra sometimes obscurely clouded.

**16. Curculio Bacchus.** Of a coppery colour; the rostrum and tarsi black.

*Inhabits Europe. B.*

Found on the Vine and Hazel; somewhat villous on the upper side.

**17. Curculio Betulae.** Of a gilded greenish colour above, and the same below.

*Inhabits Europe. B.*

Found on the Birch; the eyes and antennæ alone are black; the anterior edge of the thorax often spinous.

**18. Curculio Ulicis.** Ash-coloured; abdomen ovate; the antennæ, tarsi, all the tibiae, and the thighs of the fore-legs, red.

*Inhabits England.*

Found on the flowers of the *Ulex europæus* in Spring; very small.

**19. Curculio Rumicis.** Grey, clouded with black; the antennæ brown.

*Inhabits Europe. B.*

Found on the *Rumex*; the pupa is attached in a reddish round capsule to the seeds. There is no dent on the anterior thighs, but they are thick.

**\*\* Long snouted; the hind thighs thick and made for leaping.**

**30. Curculio Quercus.** Of a pale yellow; the eyes black.

*Inhabits Europe. B.*

## CURCULIO.

Found on the leaves of the Willow, Elm, and Oak, under the cuticle, between the large veins ; a small species.

31. *Curculio rufus*. Red, except the eyes, which are black.

*Inhabits* England.

From Donovan. Plate 249, fig. 1.

32. *Curculio Alni*. Black ; elytra testaceous ; with two obscure spots.

*Inhabits* Europe. B.

Found on the Alder ; a small species.

33. *Curculio pilosus*. Black : variegated with ash-colour.

*Inhabits* England.

34. *Curculio Salicis*. Elytra black ; with two white fasciæ.

*Inhabits* Europe. B.

Found on the flowers of the Willow.

35. *Curculio Fagi*. Body black ; the thighs pale.

*Inhabits* Europe. B.

Found on the leaves of the Beech. Elytra black and striated ; head and thorax dotted.

\*\*\* *Long snouted ; the thighs dentated.*

36. *Curculio Cerasi*. Black ; the elytra pale and oblong.

*Inhabits* Europe. B.

Found on the leaves of the Cherry and Pear, eating the epidermis, and marking the leaves with spots.

37. *Curculio Beccabungæ*. Black ; elytra red ; the whole margin black.

*Inhabits* Europe. B.

Found on the Veronica Beccabunga. A small species.

38. *Curculio Lapatii*. Variegated with black and white ; thorax and elytra muricated.

*Inhabits* Europe. B.

Found on the Willows and Rumices ; the sides of the breast, and the hinder part of the elytra whitish.

39. *Curculio pomorum*. The anterior thighs dentated ; the body grey and clouded.

*Inhabits* Europe. B.

Found



**CURCULIO.**

Found in the flowers of fruit trees ; a small species ; there are two transverse fasciæ on the elytra.

40. *Curculio caliginosus*. The striæ of the elytra close and punctured.

*Inhabits* England.

41. *Curculio Abietis*. Elytra brown ; with two linear interrupted whitish fasciæ.

*Inhabits* Europe. B.

Found on the bark and resin of the *Pinus sylvestris*. Among the largest species of British Curculios.

42. *Curculio germanus*. Black ; the thorax with two testaceous spots on each side.

*Inhabits* Europe. B.

This is among the largest of the European species. It is found in June. The elytra cover the abdomen, they are ovate, black, and covered with ferruginous dots.

43. *Curculio Nucum*. Body grey, of the length of the rostrum.

*Inhabits* Europe. B.

Found in the nuts of the Hazel. The rostrum before the antennæ is red ; the scutellum heart-shaped, and white.

44. *Curculio Cerasorum*. Brown ; the scutellum and indistinct fasciæ on the elytra ash coloured.

*Inhabits* England.

45. *Curculio tenuirostris*. Black ; the elytra with pale white fasciæ ; antennæ red.

*Inhabits* England.

Like the former species, but less. Thorax black ; set with very short ash-coloured hairs.

46. *Curculio Scrophulariæ*. The coleoptra with two black spots on the back.

*Inhabits* Europe. B.

Found on the *Scrophularia* ; the larva feeds on the pericarpia, and makes ovate, brown follicles with a sort of lid, in which it turns to a pupa.

47. *Curculio bertulanus*. Nearly globular, with two black spots on the longitudinal suture of the coleoptra.

*Inhabits* Europe. B.

Probably

## CURCULIO.

Probably but a variety of the *Scrophulariæ*.

48. *Curculio taeniatus*. Thorax black; the anterior and posterior margins red; the elytra of a pale colour spotted with black.

*Inhabits* England.

49. *Curculio Forsteri*. With very long fore-legs.

*Inhabits* England.

Of a light black colour, covered with ash-coloured hairs; the antennæ and tarsi red; the elytra ash-coloured with black dots.

50. *Curculio polinaricus*. Elytra depressed, flat, and abbreviated; the belly, the margin of the elytra, and the feet as if powdered.

*Inhabits* England.

Found on various plants, particularly the Nettle. Brown above.

\*\*\*\* Short snouted; the thighs dentated.

51. *Curculio Pyri*. Of a dark bronze colour.

*Inhabits* Europe. B.

Found in the flowers of the Pear and the Plum; the larva in the leaves of the Pear. Elytra oblong, with seven deep striae; with crenated striae between. Feet and antennæ reddish.

52. *Curculio argentatus*. Body of a light green colour.

*Inhabits* Europe. B.

Found in June on the Nettle, Birch, Hazel, and Oak. Like the former species. It varies in colour.

\*\*\*\*\* Short snouted; the thighs not dentated.

53. *Curculio griseus*. Above of a hoary brown colour, cinereous below; rostrum channelled.

*Inhabits* England.

54. *Curculio triguttatus*. Blackish; elytra grey, with two white spots; the hinder one the largest, and common to both elytra.

*Inhabits* England.

55. *Curculio Coryli*. Variegated with brown and ash-colour; the half of the suture black.

*Inhabits* England.

56. *Curculio*

CURCULIO.

56. *Curculio viridis*. Green; the 'sides' of the thorax and elytra yellow.

*Inhabits* Europe. B.

Of the size and form of the *C. Pyri*; the antennæ and feet black.

57. *Curculio lunatus*. The scutellum with elevated striae; a femicircular fascia, and a spot behind, white; with a crescent black.

*Inhabits* England.

58. *Curculio incanus*. Oblong and brown; the back of the thorax flat.

*Inhabits* Europe. B.

Found on Fir trees. Covered with very small grey hairs. Elytra oblong, not acute, with about eight punctured striae.

59. *Curculio tristis*. Black; elytra striated and cinereous.

*Inhabits* Sweden.

60. *Curculio nebulosus*. Hoary; the elytra with black oblique fasciae.

*Inhabits* Europe. B.

Found on trees and in the fields. Oblong; the thorax and elytra with numerous raised points.

61. *Curculio melanogrammus*. Body hoary; the suture of the elytra black on the anterior part, and shining; the rostrum very short.

*Inhabits* England.

62. *Curculio Avellanae*. Black; a lunated, oblique, whitish mark near the base, and a white spot near the apex of the elytra.

*Inhabits* England.

Found on the Willow in June. Given from Donovan, from whose figure it appears to belong to this section; in its specific character it is related to the *C. Capreae* and *Salicis*.

GEN. XXVIII. RHINOMACER. Antennae setaceous, situated on a rostrum; palpi four, thickest at the extremity.

*Rhinomacer curculioides*. Grey and villous; the antennae and feet black.

*Inhabits* Italy.

GEN.

GEN. XXIX. ATTELABUS. Head acuminate behind, and inclined ; antennae moniliform, thick-est towards the apex.

\* *With a bifid maxilla.*

1. *Attelabus Coryli*. Black ; the elytra red and reticulated.

*Inhabits Europe.* B.

Found on the Hazel ; the leaves of which the larva rolls up into a cylinder, close at both ends. The form of the head in this insect is remarkable ; it is shaped like a long triangle ; the acute angle attached to the thorax ; the eyes in the other two angles, and from the base the rostrum arises.

2. *Attelabus curculionoides*. Black ; thorax and elytra red.

*Inhabits Europe.* B.

Found on the Hazel and Willow. Like the former species, but less. On the elytra there are some indistinct striz.

\*\* *Maxilla with one dent.* Cleri.

3. *Attelabus formicarius*. Black ; the thorax red ; the elytra with two white fasciae ; the base red.

*Inhabits Europe and North America.* B.

Found on various flowers and shrubs. It preys upon the *Ptinus pertinax* ; the larva lives under the bark of decaying trees.

4. *Attelabus apiarius*. Bluish ; the elytra red ; with three black fasciae.

*Inhabits Europe, America. &c.* B.

Found on flowers ; it is twice the size of the former species ; the larva makes its way into Bee-hives, not so much for the honey, as to prey on the young brood. The last fascia is on the apex of the elytra.

GEN. XXX. NOTOXUS. Antennae filiform ; palpi four, securiform ; maxilla with one dent.

1. *Notoxus mollis*. Downy ; elytra black ; with three pale fasciae.

*Inhabits Europe.* B.

Found on flowers. Thorax light black, and villous ; elytra flexible ; the abdomen red.

2. *Notox-*

## NOTOXUS.

2. *Notoxus monoceros*. The thorax projecting like a horn over the head.

*Inhabits Europe.* B.

Found on flowers; elytra yellowish with black spots.

- GEN. XXXI. CERAMBYX. Antennæ setaceous; Palpi four; thorax spinous or gibbous. Elytra linear.

This is a numerous genus; it has therefore been divided into several by Fabricius. Few of them are inhabitants of Britain. Their larvæ live in wood which they perforate and consume. They are the favourite food of the Woodpeckers. They have shorter feet than the larvæ of most other Coleoptera. The antennæ are often longer than the body of the perfect insect, they are bent and have some resemblance to the horns of a goat, or stag.

\* *With equal Palpi.*

1. *Cerambyx cervicornis*. Thorax with three dents on each side; the mandibles projecting with a spine on the outside; the antennæ shorter than the body.

*Inhabits America.*

The larva of this insect lives in the wood of the *Bombax Ceiba*; and is eaten as a delicacy by the natives; as the larvæ of the *damicornis* and of some other species of this genus, are by the natives of South America. Olivier supposes that the larva of the *C. Heros*, which is common in Italy, was the *Cossus* of the Romans, a dish brought only to the tables of the rich.

2. *Cerambyx coriarius*. Thorax with three dents on each side; the body of a light black; the elytra pointed; the antennæ shorter than the body.

*Inhabits Europe.* B.

This is the largest of the British species. The larva is found in the decayed wood of the Birch. The ova are large, yellow, and oblong.

3. *Cerambyx hispidus*. Thorax with a spine on each side; the elytra whitish at the base, with two dents at the apex; the antennæ the length of the body, and rough with hairs.

*Inhabits Europe.* B.

The

## CERAMBYX.

The length of the common house-fly, but narrower; the antennæ are black above, ash-coloured below, the elytra hollowed at the apex.

4. *Cerambyx mofebatus*. Green and shining; the thorax armed with a spine, the antennæ bluish, and of the same length with the body.

*Inhabits Europe.* B.

Among the largest of the European species. It varies much as to colour; being green, purple, or coppery; the body dark-blue. It has a very strong musk-like smell. The larvæ feed on the soft wood of willows.

5. *Cerambyx aedilis*. Thorax armed with a spine, with four yellowish dots; the elytra obtuse and clouded; the antennæ much longer than the body.

*Inhabits Europe.* B.

This insect is easily known by the length of its antennæ, which are almost two inches and a half long, though the animal itself does not exceed half an inch in length; the antennæ of the female are not so long; they are however three times the length of the body. It is found on the trunks of trees.

6. *Cerambyx minutus*. Brown, thorax cylindrical, of a bluish-white colour; the thorax with three lines, and the scutellum pale.

*Inhabits England.*

A small species.

7. *Cerambyx anglicus*. Thorax armed with a spine; the elytra with two oblique yellow fasciæ.

*Inhabits England and France.*

The antennæ are but half the length of the body.

8. *Cerambyx rusticus*. Thorax without spines; the body of a lurid colour; the antennæ subulated, and shorter than the body.

*Inhabits Europe.* B.

The body is linear, and nearly smooth; two elevated striæ on each elytron.

9. *Cerambyx violaceus*. Thorax somewhat pubescent: body of a violet colour, the antennæ shorter than the body.

*Inhabits Europe.* B.

CERAMBYX.

A rare insect in England; supposed to have been introduced from Germany. Found chiefly in Epping Forest, in the neighbourhood of three posts of foreign Fir. *Donovan*. The feet are black, the thighs club-shaped; the abdomen black.

10. *Cerambyx Bajulus*. Thorax villous, with two tubercles; the body brown.

*Inhabits Europe.* B.

The larva resides in the trunks of trees, and perforates wood and furniture made of fir.

11. *Cerambyx arcuatus*. The elytra with four yellow fasciæ; the first interrupted; the others arched backwards

*Inhabits Europe.* B.

Found in gardens. The antennæ and feet ferruginous.

12. *Cerambyx Arietis*. Thorax black; elytra black, with yellow fasciæ; the second arched backwards; the feet ferruginous.

*Inhabits Europe.* B.

The antennæ red at the origin, further on black.

13. *Cerambyx plebeius*. Thorax globose, not spotted; elytra black, with white linear fasciæ.

*Inhabits Europe.* B.

Head large for the size of the insect.

14. *Cerambyx mysticus*. Elytra brown: with the apex and fasciæ cinereous; the base red.

*Inhabits Europe.* B.

The under side wholly black.

15. *Cerambyx sanguineus*. Thorax somewhat tuberculated, elytra blood-red; body black; antennæ of the same length with the body.

*Inhabits Europe.* B.

Found in woods.

16. *Cerambyx praeustus*. Black; elytra yellow, black at the apex.

*Inhabits Europe.* B.

A small species, cylindrical, the antennæ nearly the length of the body, the elytra obtuse, and almost truncated.

- \*\* *With unequal palpi; the two foremost filiform, the other two clavated.*

17. *Cerambyx meridianus*. Thorax with the appearance

**CERAMBYX.**

of a spine; the elytra fastigiated, brown, testaceous before, the breast shining.

*Inhabits* Europe. B.

The male is of a brick colour, the female blackish; the larva lives in the earth; it has very long feet in comparison with the rest of this genus.

**GEN. XXII. CALOPUS.** Antennæ filiform. Palpi four; the foremost clavated; the hinder filiform.

Thorax gibbous. Elytra linear.

*Calopus ferraticornis.* Brown; the antennæ compressed.

*Inhabits* Europe.

The antennæ on the fore part appear as if serrated: the shape of the insect is elongated and cylindrical.

**GEN. XXXIII. LEPTURA.** Antennæ setaceous.

Four filiform palpi. Elytra attenuated towards the apex. Thorax somewhat cylindrical.

\* *With an intire lip.* *Donacia*, Fabr.

1. *Leptura aquatica.* Of a golden colour; the hinder thighs clavated with a dent.

*Inhabits* Europe. B.

Found on aquatic plants; such as the Nymphaeae, Carices and Phellandrium, to the roots of which the pupa adheres, inclosed in a dusky bag. The hinder thighs sometimes want the dent.

2. *Leptura simplex.* Of a golden colour; the thighs without dent, and not clavated.

*Inhabits* Germany and England.

Found in the same places with the preceeding.

\*\* *With a bifid lip.* *Leptura*, Fabr.

3. *Leptura melanura.* Black; the elytra reddish or livid; the suture and the apex black.

*Inhabits* Europe. B.

Found on flowers. The elytra of the female are of one colour.

4. *Leptura virens.* Greenish; covered with silky hair; the antennæ variegated with brown and green.

*Inhabits* Europe. B.

The largest of the European species. Black, but the whole body covered with a greenish-yellow down. Elytra have no striae, but numerous minute points.

5. *Leptura*



LEPTURA.

5. *Leptura sexmaculata*. Black; the coleoptra testaceous, with six black spots connected with the margin.

*Inhabits* Europe. B.

6. *Leptura attenuata*. Elytra attenuated and yellow, with four black fasciæ; the feet testaceous.

*Inhabits* Europe. B.

The hind thighs black at the apex.

GEN. XXXIV. NECYDALIS. Antennæ setaceous or filiform. Four filiform Palpi: Elytra smaller, shorter or narrower than the wings. Tail simple.

- \* *Antennae setaceous; elytra shorter than the wings and the abdomen.*

1. *Necydalis minor*. Elytra testaceous; at the apex a small white line; the antennæ longer than the body.

*Inhabits* Europe. B.

Head black; thorax oblong and black with two shining spots. The elytra are angulated at the base and but half cover the abdomen, and are dehiscent at the apex. Antennæ setaceous.

2. *Necydalis viridissima*. Thorax somewhat cylindrical; body green.

*Inhabits* Europe. B.

Found in gardens. Antennæ filiform, somewhat shorter than the body; head of a golden green colour.

3. *Necydalis humeralis*. Elytra black, yellow at the base.

*Inhabits* England.

The elytra proceed diverging towards the apex.

GEN. XXXV. LAMPYRIS. Antennæ filiform. Palpi four. Elytra flexible. Thorax flat, semiorbicular, concealing and surrounding the head. The sides of the abdomen with papillary folds. The female wants wings for the most part, resembling an herbivorous larva.

## LAMPYRIS.

1. *Lampyris noctiluca*. Common Glow-worm. Oblong and brown; the clypeus ash-coloured.

*Inhabits* Europe. B.

Found in grassy places, and woods, particularly of Juniper. The female alone is luminous, and that only in June or July, the season of coupling. The light, which is phosphoric, proceeds from one or two of the last segments of the abdomen, and seems intended to attract the male; he likewise has two luminous points under the abdomen, but the light is very weak.

2. *Lampyris splendidula*. Oblong, and dark brown; the clypeus transparent at the apex.

*Inhabits* Europe. B.

Nearly allied to the foregoing species. It disperses its light chiefly in rainy weather. The female gives out most light before she has deposited her ova, and that light is more splendid when placed in oxygen.

3. *Lampyris sanguinea*. Black, the sides of the thorax and elytra of a blood-red colour.

*Inhabits* Europe. B.

The elytra are thinly striated, and have six elevated longitudinal lines.

GEN. XXXVI. HORIA. Antennæ moniliform; palpi four, growing thicker towards the extremity; lip linear, rounded at the apex.

*Horia dermestoides*. Testaceous; the eyes, wings, and breast black.

*Inhabits* Europe. B.

Found in old neglected woods. The antennæ of the same length with the thorax; the head inflexed like that of a *Dermestes*; the elytra flexible like those of a *Cantharis*.

GEN. XXXVII. CUCUJUS. Antennæ filiform; four equal palpi; the last articulation truncated and thicker than the rest; lip short and bifid; the laciniae linear and distant; body depressed.

Cu-

**CUCUJUS.**

*Cucujus depressus*. The denticulated thorax and elytra red ; feet simple and black.

*Inhabits* Germany, and Russia.

This insect, with the others of the genus, is easily distinguished by the uncommon flatness of its body. It is found under the rind of trees.

**GEN. XXXVIII. CANTHARIS.** Antennae filiform ; thorax (in most species) marginated, and shorter than the head ; elytra flexible ; the sides of the abdomen with papillary folds.

The insects of this genus prey on other insects ; both the larva and perfect insect of the last section feed on recent wood.

\* *With four securiform palpi.*

1. *Cantharis fusca*. Thorax red, with a black spot ; elytra brown.

*Inhabits* Europe. B.

A rapacious animal preying on its own species. Frequent in May and June near hedges. Head black ; elytra oblong or linear.

2. *Cantharis livida*. Wholly testaceous.

*Inhabits* Europe and North America. B.

In every respect, except colour, like the former species, with which it sometimes couples.

3. *Cantharis biguttata*. Thorax black in the middle ; the elytra abbreviated and black ; the apex yellow.

*Inhabits* Europe. B.

Head and thorax black, the latter marginated ; the segments of the abdomen yellow on the under side.

4. *Cantharis minima*. Thorax red, with a black spot ; the body brown ; the elytra yellow at the apex.

*Inhabits* Europe. B.

But a little larger than a louse. Head black ; the maxillæ yellow.

5. *Cantharis testacea*. Thorax yellow, with a black spot ; body black ; elytra and feet livid.

*Inhabits* Europe. B.

Among

## CANTHARIS.

Among the smallest of the genus. Like the livida, but only one fourth of its size.

6. *Cantharis ruficollis*. Black; the thorax and abdomen red.

*Inhabits* England.

7. *Cantharis melanura*. Thorax rounded; body yellowish; elytra black at the points.

*Inhabits* Europe. B.

**\*\* With filiform palpi; the last articulation setaceous.**

Malachius, Fabr.

8. *Cantharis aenea*. Body of a greenish bronze colour; the elytra red on the outside.

*Inhabits* Europe. B.

This insect is furnished with two red obtuse vesicles at the base of the abdomen, and other two at the apex of the thorax, which are raised and depressed alternately. Common on flowers and thistles in May.

9. *Cantharis bipustulata*. Of a greenish bronze colour; the elytra red at the apex.

*Inhabits* Europe. B.

Common on flowers like the preceding, and like it, is furnished with vesicles.

10. *Cantharis fasciata*. Thorax nearly round, and greenish; elytra black; with two red fasciae.

*Inhabits* Europe. B.

Of the size of a louse; antennæ and feet black; the sides of the abdomen red.

**\*\*\* With the anterior palpi projecting; the last articulation but one furnished with a large ovate and cleft appendage; the last acute.** Lymexylon. Fabr.

11. *Cantharis navalis*. The thorax nearly cylindrical; body yellowish; elytra black on the margin, and at the apex.

*Inhabits* Europe. B.

Found on oak-wood and ship-timber, which it destroys.

IN. XXXIX. SERROPALPUS. Antennæ setaceous; palpi four, unequal; the anterior ones longest, and deeply ferrated; with four articulations of which the last is the largest, truncated, compressed, and plate-shaped; the hind ones somewhat clavated; thorax marginated, the fore-part receiving the head, with a prominent angle on each side; head deflexed; feet formed for digging.

*Seropalpus lævigatus.* Body black, the elytra smooth.  
*Inhabits* Europe.

The *Elater buprestoides* of Fabricius, and of the former editions of the Syst. Nat. with which genus it agrees in the figure of the thorax.

IN. XL. ELATER. Antennæ filiform; palpi four, securiform; when laid on its back the insect leaps by means of a spine in its breast, springing from a cavity in the under side of the abdomen.

Many of the coleopterous insects have a great difficulty in restoring themselves when laid on the back; the apparatus with which the insects of this genus are provided for that purpose, is singular and curious. An elastic spring or spine projects from the hinder extremity of the breast, and there is a groove or cavity in the anterior part of the abdomen. When laid on its back, the insect raises and sustains itself on the anterior part of the head, and the extremity of the body, by which means the spine is removed from the groove where it is lodged, when in its natural position; then suddenly bending its body, the spine is struck with force across a small ridge or elevation, into the cavity from whence it was withdrawn, by which shock the parts of the body before sustained in the air, are so forcibly beat against whatever the insect is laid on, as to cause it to spring or rebound to a considerable distance. The antennæ are lodged in a cavity scooped out of the under side of the head and thorax, probably to preserve them when the insect falls, after its singular leap. The larvæ live in putrid wood.

1. *Elater bipustulatus.* Black and shining; the elytra with a red dot at the base.  
*Inhabits* Europe. B.

The

**ELATER.**

The elytra are striated ; the feet light black.

2. *Elater cruciatus*. Thorax black, ferruginous at the sides ; coleoptra yellow, with a cross, and the margin black.

*Inhabits* Europe. B.

The posterior sides of the abdomen and feet are red.

3. *Elater ruficollis*. Black ; the posterior part of the thorax red and shining.

*Inhabits* Europe. B.

This is among the smallest of the European species. The elytra are striated, and have a bluish tinge.

4. *Elater aterrimus*. Thorax black and shining ; elytra black and striated.

*Inhabits* Europe. B.

Thorax somewhat rough ; elytra deeply striated ; the cavities as if crenulated.

5. *Elater thoracicus*. Black ; the whole thorax red.

*Inhabits* England.

Allied to the ruficollis.

6. *Elater castaneus*. Thorax testaceous and pubescent ; elytra yellow, black at the apex ; body black.

*Inhabits* Europe. B.

It varies in colour and size ; the antennæ of the male are pectinated.

7. *Elater sanguineus*. Black ; the elytra of a blood-red colour.

*Inhabits* Europe. B.

Thorax smooth ; the extremity of the elytra black.

8. *Elater balteatus*. Black ; the anterior half of the elytra red.

*Inhabits* Europe. B.

A small species.

9. *Elater sputator*. Thorax brown and shining ; elytra testaceous ; body black.

*Inhabits* Europe. B.

Feet and antennæ red.

10. *Elater obscurus*. Light black ; the thorax and elytra dull black.

*Inhabits* Europe. B.

Like

## ELATER.

Like the foregoing species, but broader ; elytra obscurely striated ; not shining.

11. *Elater pectinicornis*. Thorax and elytra bronze-coloured ; the antennæ of the male pectinated.

*Inhabits* Europe. B.

In meadows in hilly situations. The thorax, and elytra in the male, are brighter coloured, and narrower than in the female.

12. *Elater cupreus*. Of a copper colour ; the half of the elytra yellow.

*Inhabits* England.

13. *Elater niger*. Thorax smooth ; the elytra, feet, and body black.

*Inhabits* Europe. B.

Body shorter in proportion than in the others of this genus.

14. *Elater segetis*. Black ; the antennæ and tarfi brown ; the elytra with black and brown longitudinal lines.

*Inhabits* Sweden.

The larvæ feed on the roots of corn, and lay waste whole fields, especially those that are dry ; they live a long time in that state ; a person who bred them, kept them five years before they were transformed into perfect insects.

GEN. XLI. CICINDELA. Antennæ setaceous ; palpi six, filiform ; the posterior ones hairy ; mandible projecting, with many dents ; eyes prominent ; thorax rounded and marginated.

The insects of this genus live in stony, dry, and especially sandy places ; they are voracious, and attack other insects and their larvæ, even the spiny ones ; their own larva is soft, white, long, with six feet, and lies concealed in deep cylindrical holes under ground ; and when hungry, comes out to watch for insects as they pass, seizing them with its forked mandible, and dragging them into its hole, in which likewise it undergoes its transformations.

\* *With a tridentated lip.*

1. *Cicindela campestris*. Green ; the elytra with five white dots.

*Inhabits* Europe. B.

**CICINDELA.**

A very beautiful insect; it runs swiftly, and flies easily. The thorax is angular, and narrower than the head. On the elytra are five or six white dots. The larva is found in dry sandy places. It makes a perpendicular hole in the ground, and keeps its head at the entrance to catch the insects that fall into it. A spot of ground is sometimes intirely perforated in this manner.

2. *Cicindela sylvatica*. Black; the elytra with a waved fascia, and two white dots.

*Inhabits* Europe. B.

Found in Pine forests. Like the foregoing species, but black; a white dot at the exterior angle of the base of the elytra; a little above, close to the exterior margin, another dot shaped like a crescent; towards the apex a round white spot; the fascia in the middle.

*\*\* The lip rounded, acuminated, and intire.*

3. *Cicindela riparia*. Of a greenish bronze colour; the elytra with broad excavated dots.

*Inhabits* Europe. B.

Found in moist places. The elytra have broad dots or pits, in each of which is a raised point; these pits are joined longitudinally by an elevated black line; it varies in colours.

4. *Cicindela aquatica*. Bronze-coloured and shining; the head striated.

*Inhabits* Europe. B.

Found by water sides. A small insect, the least of the British species. Elytra shining, with small punctured striae. Antennæ short and capillary.

**GEN. XLII. BUPRESTIS.** Antennæ filiform, serrated, the length of the thorax: Palpi four, filiform; the last articulation obtuse and truncated. Head half drawn in below the thorax.

Few of this numerous genus are natives of Britain; many of them are adorned with very rich and beautiful colours; the larvæ live in wood.

1. *Buprestis gigantea*. Elytra with two dents and rough; thorax smooth, body as if gilded.

*Inhabits* America and Asia.



**BUPRESTIS.**

A large and splendid insect; about two inches long, and three-fourths of an inch broad.

2. *Buprestis chrysofigma*. Elytra ferrated and longitudinally fulcated; with two sunk gold-coloured spots; thorax punctured.

*Inhabits* Europe. B.

Thorax of a reddish bronze colour; elytra of a brownish bronze, with four or five fulci in each; the four spots (two in each,) forming a square.

3. *Buprestis rustica*. Elytra striated and fastigiated; thorax punctured.

*Inhabits* Europe. B.

Found in woods. The elytra with 8 striæ.

4. *Buprestis viridis*. Elytra intire, nearly linear and punctured; thorax deflected; body green and elongated.

*Inhabits* Europe. B.

Found on the Birch, of which it eats the leaves. Varies in colour.

5. *Buprestis biguttata*. Elytra intire, linear and green, with a white dot; the abdomen blue, with three white dots.

*Inhabits* England.

6. *Buprestis Salicis*. Green and shining; the elytra intire, of a golden colour, green at the base.

*Inhabits* Europe. B.

A small but beautiful species. Head and thorax blue.

7. *Buprestis granularis*. Of a clouded bronze colour, the antennæ clavated.

*Inhabits* Europe. B.

The elytra are striated; the thorax has 5 fulci; a small species.

8. *Buprestis fuliginosa*. Elytra intire, nearly linear, rough and hairy; thorax deflexed, body of a sooty colour.

*Inhabits* Europe. B.

Found on the flowers of the *Cratægus oxyacantha*. Of the size of the *Cantharis testaceus*; the antennæ moniliform.

**GEN. XLIII. HYDROPHILUS.** Antennæ clavated, club perfoliated. Palpi four, filiform. Hinder feet villous, formed for swimming, with hardly any claws.

The insects of this and the following genus are nearly allied, differing only in the form of the antennæ and the number of the palpi. They live in waters and moist places. They may be seen in ponds during the summer, frequently rising to the surface for fresh air; they swim well, and when laid on their back restore themselves by whirling round; they rest in the shade, keep in water during the day, come abroad in the evening, and are sometimes found sitting on the plants by the edge; they fly by night; after having been long out of the water they cannot dive but with difficulty; the foremost feet of the males have a hemispherical appendage; the elytra of the females are in general sulcated: The Hydrophili resemble the Dermestides, the Dytisci are like the Carabi. The larvae live always in the water, and are the Crocodiles of their class, killing not only aquatic insects but even fishes.

1. *Hydrophilus piceus*. Black; the sternum channelled and spiny behind.

*Inhabits* Europe. B.

This is the largest of the genus. The larva lives in still waters and ponds; about an inch and a half in length; black; its head smooth and chestnut-coloured; with six slender feet which are actually placed on the back, and a tapering tail through which it respire. In the month of July, when it has attained its utmost size, it leaves the water, creeps upon the dry ground to a heap of dung, cow-dung if it be near, and makes a hole under it pretty deep and so wide as that it can lie in it rolled up in a circle, and there it goes into its pupa state. About the middle of August the perfect insect appears. Elytra smooth, hardly striated, the last articulation of the antennæ black and smooth; the rest brown and not smooth. Its eggs are inclosed in a floating nest with a long tapering point.

2. *Hydrophilus caraboides*. Black and shining, the elytra somewhat striated.

*Inhabits* Europe. B.

A good deal smaller than the former species, and not so acute behind; elytra with punctured striæ.

3. *Hydrophilus*

**HYDROPHILUS.**

3. *Hydrophilus fuscipes*. Thorax black, margin grey; elytra brown, with the margin and a dot behind whitish.

*Inhabits* Europe. B.

The palpi and feet are brown; antennæ black; thorax punctured; elytra with close punctured striæ.

4. *Hydrophilus luridus*. Elytra striated; body of a brownish ash colour.

*Inhabits* Europe. B.

The head of a blackish bronze colour. A black point in the middle of the elytra at the margin, and two obsolete ones at the longitudinal future.

**GEN. XLIV. DYTISCUS.\*** Antennæ setaceous.

Palpi six, filiform. Hind feet villous, formed for swimming, with hardly any claws.

1. *Dytiscus latissimus*. Black; the margins of the elytra dilated, with a yellow line.

*Inhabits* Europe. B.

This is the broadest, in proportion to its length, of the genus. It is a most voracious animal, preying even on its own species. The elytra of the female are sulcated.

2. *Dytiscus marginalis*. Black; the margins of the thorax, and the exterior margins of the elytra, yellow.

*Inhabits* Europe. B.

3. *Dytiscus semifstriatus*. Brownish; the elytra with ten villous sulci, reaching half way from the base.

*Inhabits* Europe. B.

These two last have been made different species, but the writer of this has frequently taken them, in the month of May, in conjunction. The *marginalis* has always the hemispherical appendages at its forefeet, the *semifstriatus* never. They are therefore the male and female of the same species.

4. *Dytiscus cinereus*. Of an ash-colour, the margin of the elytra, and middle of the thorax, yellow.

*Inhabits* Europe. B.

The most common of the genus.

The

\* This generic name is etymologically improper: it should be *Dyticus*, as Geoffroy has it.

## DYTISCUS.

5. *Dytiscus fulcatus*. The elytra with ten longitudinal sulci.

*Inhabits* Europe. B.

The elytra of the male are smooth, or when viewed with a magnifier, set with short hairs; those of the female are furrowed; the furrows, which are four on each, are filled up with brown hairs; the former has the hemispherical appendages on the fore-feet, the latter wants them.

6. *Dytiscus maculatus*. Black; the thorax black, with a pale falcia; the elytra variegated with black and white.

*Inhabits* Europe. B.

7. *Dytiscus ferrugineus*. Wholly of a ferruginous colour.

*Inhabits* Europe. B.

Of the size of a bug; wholly ferruginous or reddish; very convex.

8. *Dytiscus uliginosus*. Black and shining; antennæ, feet, and outer sides of the elytra yellow.

*Inhabits* Europe. B.

Body ovate and smooth.

9. *Dytiscus minutus*. Elytra brown, pale at the base and sides; thorax yellow, and not spotted; body ovate.

*Inhabits* Europe. B.

Small species; elytra with some pale and oblique striæ, with punctures hardly perceptible.

10. *Dytiscus glaber*. Brown; elytra smooth; belly and feet ferruginous.

*Inhabits* England.

11. *Dytiscus nebulosus*. Livid, and clouded with black; the antennæ and feet ferruginous; belly black, with a ferruginous margin.

*Inhabits* England.

12. *Dytiscus exfoletus*. Livid; the antennæ, head, thorax, abdomen, and feet, pale.

*Inhabits* England.

GEN.

GEN. XLV. CARABUS. Antennæ filiform ; palpi fix, the last articulation obtuse and truncated ; rhorax obcordate, truncated at the apex, and margined ; elytra margined.

The insects of this genus are very voracious, preying on other insects, particularly on larvæ ; they have large maxillæ ; they have long legs with five articulations in their tarsi, and, in general, run very swiftly ; many of them have a singular appendage at the hinder thighs, called a *trochanter* by Linnaeus, which, perhaps, assists them in running ; they discharge, when taken, a brown, caustic, and fetid liquor ; many of them want wings, though their elytra are separate and moveable ; their larvæ live in putrid wood, among mosses, in the earth, &c.

\* *Large.*

1. *Carabus granulatus*. Apterous and blackish ; elytra bronzed, and striated, with longitudinal elevated points between.

*Inhabits Europe.* B.

The thorax is greenish, bronzed ; the elytra have three elevated lines, with three rows of longitudinal points between them.

2. *Carabus hortensis*. Apterous and black ; thorax broad ; elytra somewhat rough, with a triple row of bronzed excavated points.

*Inhabits Europe.* B.

The thorax is black and convex, nearly of the breadth of the base of the elytra ; the margin purplish ; the elytra not at all striated.

3. *Carabus gemmatus*. Apterous and black ; elytra striated, with a triple row of doubled excavated bronzed points.

*Inhabits Europe.* B.

The thorax is black, but not convex ; the margin greenish ; the margin of the elytra approaching to a violet colour.

4. *Carabus leucophthalmos*. Apterous ; elytra smooth, with eight obsolete striæ.

*Inhabits Europe.* B.

The elytra, besides the eight striæ, have two others at the exterior margin. The thorax, in proportion to the size of the insect, is less than in the other species. The reference

## CARABUS.

by Linnæus and Fabricius to Lister, is improper, as his species has wings, and flies.

5. *Carabus auratus*. Apterous; the elytra porcated, with smooth gilded striæ and fulci.

*Inhabits* Europe. B.

Head bronzed; thorax obcordated and bronzed; hardly margined; the elytra without punctures. The most beautiful of the British Carabi.

6. *Carabus violaceus*. Apterous and black; the margins of the thorax and elytra violaceous; the elytra somewhat punctured and smooth.

*Inhabits* Europe. B.

The elytra are very slightly punctured, but not striated.

7. *Carabus purpurascens*. Apterous and black; the margins of the thorax and elytra violaceous; the elytra rough with striated punctures.

*Inhabits* Europe. B.

Agrees in size and habit with the preceding; but differs in the punctures on the elytra being in striæ, and in the thorax being narrower behind.

8. *Carabus cephalotes*. Apterous; elytra smooth and black; thorax oblong and exerted.

*Inhabits* Europe. B.

The elytra are not striated.

\*\* *Small.*

9. *Carabus ruficornis*. Black: elytra fulcated and smooth; antennæ and feet red.

*Inhabits* Europe. B.

Frequent in woods in the summer months, where it runs swiftly.

10. *Carabus spinibarbis*. Blue; thorax orbicular, the mouth, antennæ, and tibiæ red.

*Inhabits* England.

11. *Carabus crepitans*. The thorax, head, and feet, ferruginous; elytra black.

*Inhabits* Europe. B.

For and is said to beat off the larger Carabi, by and from the abdomen.

12. *Carabus*

CARABUS.

12. *Carabus cyanocephalus*. Thorax and feet ferruginous; elytra and head blue.  
*Inhabits* Europe. B.  
 The elytra shining, hardly striated.
13. *Carabus melanocephalus*. Thorax and feet ferruginous; elytra and head black.  
*Inhabits* Europe. B.  
 Elytra striated.
14. *Carabus ferrugineus*. Of a ferruginous colour; the thorax very smooth.  
*Inhabits* Europe. B.  
 Thorax shining; elytra striated; feet and antennæ lighter coloured.
15. *Carabus vulgaris*. Of a blackish bronze colour; the antennæ and feet black.  
*Inhabits* Europe. B.  
 Very common in May; runs swiftly; the colours vary; thorax darker and more shining than the elytra, with two obsolete impressions. Elytra striated.
16. *Carabus caeruleus*. Blackish blue; antennæ red at the base.  
*Inhabits* Europe. B.  
 About the size of the common house-fly. Elytra striated, each with three longitudinal points. Thighs black, tibiae red.
17. *Carabus cupreus*. Of a greenish coppery colour; antennæ red at the base.  
*Inhabits* Europe. B.  
 Body black; the first and second articulations of the antennæ ferruginous, with a few hairs.
18. *Carabus madidus*. Black; with a depression on each side of the thorax behind; the thighs red.  
*Inhabits* England.
19. *Carabus rufescens*. Ferruginous, the thorax rounded; the crown of the head and the anus black.  
*Inhabits* England.
20. *Carabus bipustulatus*. Thorax orbicular, and with the elytra, black, with two red spots on the latter.  
*Inhabits* England.
21. *Carabus*

## CARABUS.

21. *Carabus sexpunctatus*. Somewhat bronzed; the elytra with six longitudinal punctures.

*Inhabits* Europe. B.

Thorax margined, with a depression behind in each angle. Elytra shining; the punctures between the second and third striae.

22. *Carabus ustulatus*. Thorax black; elytra dark-brown with two pale fasciae.

*Inhabits* Europe. B.

It varies with spots instead of fasciae.

23. *Carabus Crux major*. Thorax and head of a reddish black colour; the coleoptra ferruginous, with a large black spot on the back.

*Inhabits* Europe.

Thorax suborbicular and smooth. Elytra truncated, and a little shorter than the abdomen, slightly striated.

24. *Carabus Crux minor*. Thorax yellow and smooth; elytra black behind, with two yellow spots.

*Inhabits* Europe. B.

Thorax round and smooth. Elytra striated, not truncated.

25. *Carabus quadrimaculatus*. Thorax ferruginous and smooth; elytra very obtuse and brown, with two white spots.

*Inhabits* Europe. B.

Thorax margined; elytra somewhat striated, truncated, and obtuse, a little shorter than the abdomen.

26. *Carabus quadriguttatus*. Thorax round and black; elytra black, with four white spots.

*Inhabits* England.

GEN. XLVI. TENEBRIO. Antennæ moniliform; the last articulation nearly round. Thorax with a small degree of convexity, and margined. Head standing out. Elytra somewhat rigid.

The insects of this genus fly but little, and many of them want wings, but they run easily, and generally emit a very fetid smell, whence they have been called *stinking beetles*. Their larvæ are not often found, as they hide themselves under



**TENEBRIO.**

under ground where they undergo their transformations; some of them are found under heaps of weeds, branches of trees, and other refuse of gardens; others in meal, neglected and dry bread, &c.

1. *Tenebrio Molitor*. Wholly black; the anterior thighs the thickest.

*Inhabits* Europe. B.

The larvæ of this insect, are called *Meal worms*, and are found in meal, in bakers ovens, in dry bread, &c. they are of a pale colour, smooth, with thirteen segments, soft, and are a favourite food of Nightingales, and other Motacillæ.

2. *Tenebrio caraboides*. Black; thorax oval and margined, elytra striated.

*Inhabits* Europe. B.

With wings; the thorax resembles that of a Carabus; the thighs are clavated; the maxillæ of the length of the head.

**GEN. XLVII. PIMELIA.** Antennæ filiform; palpi four; thorax with a small degree of convexity, and margined; head standing out; elytra somewhat rigid; wings (in most species) wanting.

\* *Antennæ moniliform at the apex.*

1. *Pimelia mortifaga*. Black; coleoptera ending in a point, and imooth.

*Inhabits* Europe. B.

This species wants the wings; it walks slowly, and is therefore called the slow-legged beetle; when taken, it emits a certain colourless, but very fetid liquor. It is found in moist places, about churches, &c. The male has a long slender exerted penis, twisted like the tendril of a vine. This is the beetle ment oned by Mr Henry Baker in the 457th number of the Philosphical Transactions; he had repeatedly plunged it into spirits of wine, which soon kills most other insects, but after sometimes lying a whole night in the spirits, it always revived, and lived with him three years without any food whatever, and at last made its escape.

\*\* *Antennæ wholly filiform.*

2. *Pimelia caerulea*. Bluish; thorax nearly orbicular; elytra striated.

*Inhabits* Europe. B.

**PIMELIA.**

Without wings. Like the *morsifaga*; the elytra bluish on the margins, but not ending in a point.

3. *Pimelia ferrata*. Black; the tibiæ ferruginous; the palpi standing out.

*Inhabits* England and Germany.

With wings. Thorax somewhat heart-shaped; the elytra striated.

4. *Pimelia anglica*. Black; thorax rounded before; elytra with punctured striæ; antennæ red at the apex.

*Inhabits* England.

5. *Pimelia quisquilia*. Black; the antennæ and feet ferruginous.

*Inhabits* Europe. B.

**GEN. XLVIII. SCAURUS.** Antennæ moniliform at the extremities; palpi unequal and filiform; lip truncated and intire; thorax rounded and convex. Elytra connected and obtuse; no wings.

*Scaurus atratus*.

*Inhabits* Egypt.

There is but this species of the genus; it is omitted by Gmelin.

**GEN. XLIX. MANTICORA.** Antennæ filiform; the articulations cylindrical; palpi four, filiform; thorax rounded before, behind emarginated at the apex; head standing straight out; the mandible exerted, and standing straight out; elytra connected; no wings.

*Manticora maxillofa*.

*Inhabits* the Cape of Good Hope.

This is a common insect at the Cape; it is frequent on roads, running swiftly, and biting when taken. It has the habit of a Carabus. There is but this species of the genus.

**GEN.**

GEN. I. **ERODIUS.** Antennæ moniliform. Palpi four, filiform. Maxilla horny, bifid, and truncated. Lip horny, emarginated.

The insects of this genus are all exotic.

1. *Erodium testudinarius.* Gibbous and black, elytra connected and rough; the sides covered with a whitish dust.

*Inhabits* the Cape of Good Hope.

GEN. II. **LYTTA.** Antennæ filiform. Palpi four, unequal, the hind ones clavated. Thorax somewhat round. Head inflexed and gibbous. Elytra soft and flexible.

1. *Lytta vesicatoria.* Green, the antennæ black.

*Inhabits* the South of Europe and Asia.

This is the common Spanish fly. It is found on the Privet, the Ash, the Elder, the Poplar and many other trees and shrubs; in Calabria, it is found on the *Asperula*. It is so light, when dried, that fifty of them scarcely weigh a dram.

2. *Lytta nitidula.* Of a greenish bronze colour; the elytra testaceous.

*Inhabits* England.

GEN. LII. **MELOE.** Antennæ moniliform. Thorax nearly round. Elytra soft and flexible. Head inflexed, gibbous.

\* *Without wings; the elytra abbreviated.*

1. *Meloë Proscarabæus.* Of a violet colour.

*Inhabits* Europe. B.

Found in spring, particularly in open sandy fields, feeding on the different species of *Ranunculus*, *Veratrum*, &c.; its ova have an agreeable smell; when touched, there issues from it a very limpid yellowish oil, which is exceedingly diuretic, and, when mixed with honey or oil, has been recommended in cases of *Hydrophobia*.

2. *Meloe*

## MELOE.

2. *Meloë majalis*. The abdominal segments red on the back.

*Inhabits* Southern Europe.

Much akin to the former.

**\*\* With wings ; the elytra not abbreviated.**

3. *Meloë Cichorii*. Black ; the elytra yellow ; with three black fasciæ.

*Inhabits* the East.

It is found likewise in Siberia and Calabria on the *Succory*. It is of the size of the *M. Proscarabæus* ; the antennæ are sometimes yellow at the apex. In China it is used for medicinal purposes. It is frequent in collections from thence.

4. *Meloë testæ*. Black ; elytra not shorter than the abdomen ; antennæ thickest in the middle.

*Inhabits* Germany. B.

From Donovan : found on Epping forest in July. Of a bluish black colour ; the fourth, fifth and sixth articulations of the antennæ remarkably large and globular.

GEN. LIII. MORDELLA. Antennæ moniliform or pectinated. Palpi four, the anterior ones clavated, the hinder filiform. When frightened, it hides its head below the thorax. Elytra curved downwards towards the apex. Before the thighs a broad plate at the base of the abdomen.

The insects of this genus are small, and harbour in flowers.

1. *Mordella aculeata*. Black, the anus terminating in a spine.

*Inhabits* Europe. B.

Frequent in the semiofuscous and umbelliferous flowers ; antennæ moniliform.

2. *Mordella Oxyacanthæ*. Testaceous, the head black ; the thorax brown.

*Inhabits* England.

Found on the flowers of the White Thorn.

3. *Mordella*

**MORDELLA.**

3. *Mordella melanopus*. Black ; the elytra, thorax, head, and feet testaceous.

*Inhabits* England.

Found likewise on the flowers of the White Thorn.

4. *Mordella bicolor*. Black ; the elytra testaceous, black at the apex, with a black fascia in the middle.

*Inhabits* England.

Found on the flowers of the White thorn, the Rumices and umbelliferous plants.

5. *Mordella clavicornis*. Wholly black.

*Inhabits* England.

This species is an exception to the generic character, its antennæ being clavated. It is found on the flowers of the Rhubarb and many others.

**GEN. LIV. STAPHYLINUS. Antennae moniliform.**

Palpi four. Elytra half the length of the abdomen, and covering the wings ; the tail simple, thrusting out two oblong vesicles.

The insects of this genus are very voracious, and live on other insects ; they bite fiercely, and, in general, delight in moist places ; when danger threatens, they erect their tail, and thrust out from it two vesicular bodies, which are, no doubt, weapons of defence. They are of an elongated shape.

\* *With filiform palpi.*

1. *Staphylinus murinus*. Pubescent, of an ash colour clouded with black.

*Inhabits* Europe. B.

Thorax narrow ; elytra short, of the same colour with the head and thorax ; tail armed with two villous bristles : when the abdomen is pressed, there issue from the tail two soft, recurved, white, pellucid bodies like small horns. The larva has six feet ; is naked, pale coloured. the head and three first segments brown ; the tail armed with two articulated setæ, and underneath with a cylindrical, hollow tubercle, shaped like a foot.

2. *Staphylinus olens*. Black, opaque, not spotted ; head broader than the thorax.

*Inhabits* Europe. B.

The

## STAPHYLINUS.

The largest of the European species ; is found in carcases ; the last articulation of the antennæ is hollowed and shaped like a crescent.

3. *Staphylinus maxillofus*. Pubescent, black, with ash-coloured fasciæ ; the maxillæ as long as the head.  
*Inhabits* Europe. B.  
About half the size of the *Oleus* ; is found in woods ; head and thorax black and smooth ; elytra obtuse.
4. *Staphylinus erythropterus*. Black : the elytra, the base of the antennæ, and the feet, red.  
*Inhabits* Europe. B.  
Found in dung. Among the larger species of the genus, but not the largest.
5. *Staphylinus politus*. Black ; the thorax and elytra shining.  
*Inhabits* Europe. B.  
Found in carcases ; the elytra vary, being sometimes bluish or greenish ; they are thickly set with minute punctures.
6. *Staphylinus brunnipes*. Black ; the feet, with the base and apex of the antennæ, ferruginous.  
*Inhabits* England.  
Of the figure and size of the *politus*.
7. *Staphylinus obtusus*. Testaceous ; the anterior part of the elytra and the anus black.  
*Inhabits* Germany, and England.  
A small species ; the breast between the hinder thighs brown.
8. *Staphylinus chrysomelinus*. Black ; the thorax, elytra, and feet, red.  
*Inhabits* Europe. B.  
Found on sand, and near walls.
9. *Staphylinus hypnorum*. Black and smooth ; the sides of the thorax, the elytra and feet testaceous.  
*Inhabits* England.  
Found in mosses, particularly of the genus *Hypnum*.
10. *Staphylinus nitidulus*. Black ; the margins of the thorax yellowish ; the elytra ferruginous, with a black margin.  
*Inhabits* England.

STAPHYLINUS.

11. *Staphylinus atricapillus*. Thorax red; the elytra brown, with a point at the base, and the hinder margin white.

*Inhabits* England.

12. *Staphylinus marginellus*. Black; the lateral and hinder margin of the elytra ferruginous.

*Inhabits* England.

Found in dung.

13. *Staphylinus rugosus*. Black; the thorax and elytra rough.

*Inhabits* England.

\*\* *The hinder palpi securiform.*

14. *Staphylinus rufus*. Red; the head, and hind parts of the elytra and abdomen black; the thighs black at the base.

*Inhabits* Europe. B.

\*\*\* *The anterior palpi clavated.*

15. *Staphylinus riparius*. Red; the elytra blue; the head and apex of the abdomen black.

*Inhabits* Europe. B.

Found in moist sandy places, and on the sides of banks.

GEN. LV. FORFICULA. Antennæ setaceous. Palpi unequal and filiform. Elytra half the length of the abdomen. Wings covered. Tail armed with a kind of forceps.

The larvæ of the insects of this genus run quickly, and are very like the perfect insect.

1. *Forficula auricularia*. Elytra white at the apex; the antennæ with fourteen articulations.

*Inhabits* Europe. B.

This insect is well known: it has got the common name of *Earwig*, from the fable of its entering the brain by the ear and causing death. It is common in gardens, where it lives on ripe fruits, and harbours in carnations and other flowers and plants, which afford it shelter; it is greedily eaten by domestic poultry.

## BLATTA.

1. *Blatta americana*. Ferruginous, the hinder part of the clypeus of the thorax whitish.

*Inhabits* America.

This is the American Cockroach; a most destructive insect; often brought alive to Europe in the West India ships.

2. *Blatta orientalis*. Of a ferruginous brown colour, not spotted; the elytra abbreviated, with an oblong fulcus.

*Inhabits* America. B.

This insect is originally a native of South America, whence it has been carried to the East Indies, and is now spread over the most of Europe. It frequents kitchens and ovens, and warm places, and devours meal, bread, and other provisions, shoes, &c.; it conceals itself during the day, and comes abroad in the night; it runs quickly, and is very tenacious of life. The female wants wings.

**GEN. LVII. PNEUMORA.** Body ovate, inflated, transparent. Head inflexed; furnished with maxillæ. Thorax convex; carinated below. Elytra deflexed and membranaceous. Feet formed for running.

The insects of this genus seem to consist of a hollow membrane; their feet are dentated, for the purpose of rubbing against the body, by which, at the dawn and in the twilight, they make a noise; they fly to the light. They are all inhabitants of the Cape of Good Hope.

*Pneumora immaculata*. The elytra without spots.

*Inhabits* the Cape of Good Hope.

Found on the *Stoebe cernua*; it is frequent from September to November; of a green colour; the elytra sometimes marked with small black punctures; more rarely yellowish or reddish. It is about double the size of the house cricket.

**GEN. LVIII. MANTIS.** Head inclined; furnished with maxillæ and with filiform palpi. Antennæ setaceous; four membranaceous convoluted wings; the inferior ones folded. Forefeet compressed;

M 2

below



## MANTIS.

below ferrated or denticulated, and armed with a solitary claw and a setaceous digitus, which is lateral and articulated; the four hind feet smooth, and formed for walking. Thorax linear, elongated, and narrow.

Of this singular genus of insects none are natives of Britain, and very few of Europe.

1. *Mantis religiosa*. Thorax smooth and subcarinated; elytra green and not spotted.

*Inhabits* Siberia, Austria, and Africa.

This with the following species, have their trivial names from an action common to them, and most others of the genus, namely, the motion of their forefeet, which appears like that of the hands of a person praying. They go mostly on their hind feet, and move their fore feet in order to catch flies. The Turks believe that they stand with their heads towards Mecca, and move their hands in prayer to Mahomet. This species has been known to live ten years.

2. *Mantis oratoria*. Thorax smooth; elytra green, the wings with a black spot; reddish before.

*Inhabits* the East, and Southern Europe.

**GEN. LIX. GRILLUS.** Head inflected, furnished with maxillæ, and filiform palpi. Antennæ setaceous or filiform. Wings four, deflexed and convoluted; the under ones folded. Hind feet formed for leaping. Two claws on all the feet.

This is a numerous genus, and has been split into many by Fabricius; but Gmelin has retained the generic name of Gryllus, dividing it into sections which correspond to the genera of the former Entomologist. All the Grylli, except perhaps those of the first section, which live on other insects, are herbivorous; the Achetæ chiefly live on the roots; the Tettigonæ and Locustæ, on the leaves. The larvæ and pupæ of the whole have six feet, are active, and resemble the perfect insect; the larvæ want wings, often live under ground; the pupæ frequently feed along with the perfect insect; in a few species there is a glassy ocellus in the elytra, which

**GRYLLUS.**

which is the instrument of the sound they make. In coitu the female sits on the back of the male.

\* *Antennae ensiform ; head conical and longer than the thorax.* Acrydia, Fabr.

1. *Gryllus nasutus.* Body green. (Plate IX. fig. 7.)  
*Inhabits* Africa, Sicily, and Calabria.

The antennæ are situated at the apex, and the mouth at the base of the head ; the antennæ not longer than the thorax.

\*\* *Thorax carinated, longer than the antennae which are filiform, the palpi equal.* Acrydia, Fabr.

2. *Gryllus bipunctatus.* Brownish ; the scutellum of the thorax as long as the abdomen.  
*Inhabits* Europe. B.

A small species. It is easily distinguished by the length of the scutellum, and the shortness of the antennæ.

\*\*\* *Antennae setaceous ; palpi unequal ; thorax rounded ; the tail with two setae.* Acheta.

3. *Gryllus Gryllotalpa.* With tailed wings, longer than the elytra ; the anterior feet palmated and downy. (Plate VII. fig. 2.)  
*Inhabits* Europe. B.

These curious insects, called Mole Crickets, frequent the sides of ponds and banks of streams : they burrow and work under ground like the mole, raising a ridge as they proceed, but seldom throw up hillocks. They sometimes destroy whole beds of cabbages, young legumes and flowers. At night they come abroad and make long excursions. In fine weather, about the middle of April, and at the close of day, they begin to utter a low, dull, jarring note, continued for a long time without interruption. About the beginning of May they lay their eggs, two hundred or more, below ground, the female being excessively solicitous to preserve them from cold and accidents. They are said to be attracted to gardens by horse dung, and to be expelled by the dung of hogs.

4. *Gryllus domesticus.* With tailed wings, longer than the elytra, feet simple, body glaucous.  
*Inhabits* Europe. B.

This is the common Cricket. These insects delight in new built houses, and are particularly fond of kitchens and bakers  
ovens,

## GRYLLUS.

ovens, on account of their perpetual warmth. They chirp the whole year round, and chiefly during the night, when they come out of their holes. They shew a great propensity to liquids, and are frequently drowned in vessels of water, milk, &c. they are likewise very voracious. In summer they sometimes fly out of the windows, and thus suddenly quit their former haunts. Their noise is occasioned by a quick attrition of their wings. They may be taken, like wasps, by bottles filled with beer, &c.

5. *Gryllus campestris*. Wings shorter than the body, which is black; with a linear stripe.

*Inhabits Europe.* B.

These insects live in holes, in dry soils, making a very curious subterraneous abode, with regular cells. They are solitary beings. Sitting in the entrance of their caverns, they chirp all night as well as day, from the middle of May to the middle of July; the noise they make is probably to allure the females, for the males alone make the chirping. They begin to appear and to form their holes in March, and in August these holes are obliterated.

\*\*\*\* *Antennae setaceous; palpi unequal; the tail of the female has an ensiform process.* Tettigoniæ. Locustæ, Fabr.

6. *Gryllus viridissimus*. Thorax rounded, wings green and not spotted; the antennæ very long.

*Inhabits Europe.* B.

Found in grassy places, and in fields of barley; in the middle of summer it chirps through the night; it is wholly green. Among the largest of the European species.

7. *Gryllus verrucivorus*. Thorax nearly square and smooth: wings green with brown spots; antennæ setaceous, of the length of the body.

*Inhabits Europe.* B.

The peasants in Sweden apply this insect to their hands, when afflicted with warts, which it removes. It is of a dark brown or mouse colour.

8. *Gryllus varius*. Thorax green, with yellow lines; the forehead acuminate; the antennæ longer than the body.

*Inhabits Europe.* B.

This

**GRYLLUS.**

This species is like the *viridissimus*, but only one fourth of its size.

\*\*\*\* *Antennae filiform, palpi simple, tail simple.*  
Locustæ, Grylli, Fabr.

9. *Gryllus migratorius*. Thorax subcarinated, consisting of a single legment; the head obtuse.

*Inhabits* Tartary.

This is the locust which, at certain times, migrates into Europe, and, in such numbers, as to devastate the whole vegetable produce where they settle. They are thrown alive, by the Egyptians, on burning coals, and eaten, except the wings and the feet, which are cast away.

10. *Gryllus caerulefcens*. Thorax subcarinated; the wings of a bluish green colour, with a black fascia.

*Inhabits* Europe. B.

11. *Gryllus stridulus*. Thorax subcarinated; wings red, black on the outside.

*Inhabits* Europe. B.

Found in dry sandy places, chirping the whole day, till late at night. It is black, or variegated with black and yellow.

12. *Gryllus biguttulus*. Thorax cruciated; elytra clouded; with a white oblong point near the apex.

*Inhabits* Europe. B.

It is frequent in sterile fields in the month of August.

13. *Gryllus grossus*. Thighs of a blood-red colour; elytra of a reddish green, antennæ cylindrical.

*Inhabits* Europe. B.

The most common Grasshopper with us.

**GEN. LX. FULGORA.** Head with a produced and empty snout. Antennæ short, placed below the eyes, with two articulations, the rest globose and longer than the rest. Rostrum inflected and elongated; the vagina with five articulations. Feet formed for walking.

Of this genus, only two species have yet been discovered in Europe.

1 Fulgora

**FULGORA.**

1. *Fulgora Laternaria*. The frontal snout straight; the wings vivid; the under wings ocellated.

*Inhabits* South America.

This is the insect called *Lanthorn Fly* in the West Indies; from its prominent snout, which is as large as the rest of the body, it gives out a very vivid light in the dark.

2. *Fulgora Candelaria*. The frontal snout turning up; the elytra green, with yellow spots; wings yellow, black at the points.

*Inhabits* China.

This is another *Lanthorn fly*; it is very common in collections of insects from China.

3. *Fulgora europaea*. The front conical; the body green; the wings transparent and reticulated; the under part of the tarsi red.

*Inhabits* France and Germany.

A small insect; the head and thorax with three elevated lines. It has been found in England, but rarely.

**GEN. LXI. CICADA.** Rostrum inflected; antennæ setaceous; wings four, membranaceous and deflexed. Feet in most species made for leaping.

The Cicadae live on the juices of plants; the larvæ want wings; the pupa has merely the rudiments of wings; they have both six feet, and run; they are very like the perfect insect; the larvae of the *Cercopides* are the most active. The Cicadae chirp like the *Grylli*. The larvæ of the *Manniferæ*, the *Tettigometrae* of the ancients, burrow and live under the earth the whole year; when perfect, the males chirp among the shrubs by means of two lamellæ which cover the abdomen below, and in this way attract the females.

\* *Antennæ subulated, inserted in the forehead.* Membracis, Fabr.

1. *Cicada Genistæ*. Thorax brown, produced behind, half the length of the abdomen.

*Inhabits* England.

Found on the *Genista tinctoria*.

2 *Cicada*

## CICADA.

2. *Cicada cornuta*. Thorax black, with two horns, subululated behind, of the length of the abdomen; the wings brown.

*Inhabits* Europe. B.

Found on thistles and willows.

\*\* *Not leapers*. Manniferæ. Tettigoniæ, Fabr.

3. *Cicada plebeia*. The apex of the scutellum bidentated; the elytra with four ramifications, and six lines, ferruginous.

*Inhabits* Italy and Africa.

The largest of the genus.

4. *Cicada Orni*. The elytra with six concatenated points, and the interior ramifications brown.

*Inhabits* Southern Europe.

The larva of this species is eatable. The chirping of the *Cicada* seems to have been much relished by the ancients; and this, and the former species are those so often praised by Anacreon and Virgil.

\*\*\* *Antennæ filiform, inserted under the eyes.*

a. *The vagina of the rostrum standing out, obtuse, grooved above.* Cercopis, Fabr.

5. *Cicada sanguinolenta*. Black, the elytra with two blood-red spots, and a fascia.

*Inhabits* Europe. B.

Found on the chalky and sandy soils of Dartford; the most beautiful of the British *Cicadæ*.

6. *Cicada spumaria*. Brown; the elytra with two white lateral spots; and a double whitish interrupted fascia.

*Inhabits* Europe. B.

The larva of this species is the inhabitant of what is called Cuckoo-spit, so frequently seen in the summer on roses, grasses, and the fallow. Like many others of this section and the next, it discharges from the vent the froth in which it lives during its larva state. The perfect insect seldom flies, but, at one spring, it can leap the length of two or three yards.

## CICADA.

7. *Cicada striata*. Elytra striated with black and white, at the acute angle of the dorsal suture.

*Inhabits* Europe. B.

b. *The vagina of the rostrum very short, membranaceous, cylindrical and obtuse.* Cicada, Fabr.

8. *Cicada fulgida*. Yellow, the elytra of a dark bronze colour.

*Inhabits* England.

9. *Cicada leucocephala*. Black; the head white.

*Inhabits* Europe. B.

10. *Cicada lateralis*. Black; the elytra white at the sides.

*Inhabits* Europe. B.

11. *Cicada interrupta*. Elytra yellow, with two black interrupted longitudinal lines.

*Inhabits* Europe. B.

12. *Cicada Serratulæ*. Yellow; elytra white, with a dot and two fasciæ black.

*Inhabits* England.

c. *With deflected wings, folding over the sides.*

13. *Cicada viridis*. Elytra green; head yellow, with black dots.

*Inhabits* Europe. B.

Varies sometimes with bluish elytra. Found on aquatic plants.

14. *Cicada Ulmi*. Wings yellowish green; blackish bronze at the apex.

*Inhabits* Europe. B.

Found on the Elm.

15. *Cicada cuspidata*. Grey; head depressed and flat, brown at the apex.

*Inhabits* England.

16. *Cicada Rosæ*. Yellow; wings white, brown at the apex, and striated.

*Inhabits* Europe. B.

Found on the leaves of the Rose.

## CICADA.

17. *Cicada dilatata*. Brown, pale, with faint whitish and dark lines, a small black spot on the centre of each wing.

*Inhabits* France. B.

Given from Donovan. Plate 138. fig. 5. 6. a rare insect in England.

- GEN. LXII. NOTONECTA. Rostrum inflected; antennæ shorter than the thorax; wings four, folded together cross-wise, coriaceous at the base; hinder feet hairy, formed for swimming.

The insects of this and the following genus live in water, feeding on aquatic animalcula; the larva and pupa have each six feet, they are active, and swim like the perfect insect; the former wants wings, the latter has the rudiments of them.

1. *Notonecta glauca*. Elytra grey, with a brown dotted margin, bifid at the apex.

*Inhabits* Europe. B.

This insect swims on its back, but, in that situation, with great velocity darts on water insects, which are its food. Its rostrum is a weapon of defence. It drops its eggs in the water, which are so heavy, that they fall to the bottom, where they remain till the larva appears.

2. *Notonecta minutissima*. Grey; the head brown; the elytra truncated.

*Inhabits* Europe. B.

The size of a grain of sand; Geoffroy says it wants the wings and elytra, and appears like a larva.

3. *Notonecta striata*. Elytra brown; with very numerous undulated transverse lines.

*Inhabits* Europe. B.

Somewhat less than the *glauca*, but depressed; body yellowish below; the eyes blackish.

- GEN. LXIII. NEPA. Rostrum inflected; antennæ short; wings four, folded together cross-wise, the anterior part of them coriaceous; the two fore-feet cheliform; the others formed for walking.



## NEPA.

The insects of this genus live on all sorts of living or dead aquatic animals ; the females lay their eggs either in the water, when they fall to the bottom, or attach them to the stalk of aquatic plants.

1. *Nepa grandis*. Without a tail ; of a testaceous colour spotted with yellow.

*Inhabits* America.

The largest of the genus. Frequent in collections of foreign insects.

2. *Nepa cinerea*. Of an ash-colour ; the thorax unequal, the body oblong ovate.

*Inhabits* Europe. B.

The abdomen is red above ; the antennæ are with difficulty seen, being always hidden in a cavity under the eyes ; without a tail.

3. *Nepa linearis*. Of a linear shape ; the fore-feet are hands (*manus*), with a lateral spine, by way of thumb.

*Inhabits* Europe. B.

Not very common in this country ; the tail consists of two setæ, of the length of the abdomen.

4. *Nepa cimicoides*. The margin of the abdomen serrated.

*Inhabits* Europe. B.

Has the habit of a *Cimex* or a *Notonecta* ; without a tail less than the *cinerea*.

**GEN. LXIV. CIMEX.** Rostrum inflected ; antennæ longer than the thorax ; wings four, folded over one another cross-wise ; the upper ones coriaceous in the anterior part ; back flat ; thorax margined ; feet formed for running.

The insects of this numerous genus, whether as larvæ, or as perfect insects, feed, for the most part, on the juices of plants ; some on those of other animals ; they have, in general, a very disagreeable smell. The larva and pupa have six feet ; they are active, and walk about like the perfect insect ; the former has no wings, the latter has the rudiments of them.

## CIMEX.

them. The genus consists of nearly 700 species, and has, consequently been divided into sections as follows :

- \* The antennæ placed before the eyes.
  - † Without a lip. *Acanthia* Fabr.
    - A. Without wings. *Apteri.*
    - B. The elytra almost wholly coriaceous. *Coleoprati.*
    - C. Much depressed. *Membranacei.*
  - †† Lip elongated, subelated, and annulated.
    - A. The scutellum as long as the abdomen. *Scutellati.*
    - B. The thorax with a spine on each side. *Spinofi.*
    - C. The thorax without spines.
      - a. Of a round or oval shape. *Rotundati.*
      - b. Of an oblong shape. *Oblongi.*
        - α. Antennæ capillary at the apex.
        - β. Antennæ clavated.
        - γ. Antennæ filiform.
        - δ. Antennæ setaceous.
      - c. Body narrow and elongated. *Lineates.*
- \*\* Antennæ placed above the eyes, the rostrum arched. *Reduvi.*

\* A. *Apteri.*1. *Cimex lectularius.* Without wings.

*Inhabits* Europe. B.

This insect, the bed-bug, is unhappily but too well known, and was an inhabitant of Europe, prior to the Christian æra ; at least it is mentioned by Aristophanes and other Greek writers. Southall says it was hardly known in London before 1670, but there is good authority for asserting, that it was common enough there before the great fire in 1666. It is a nocturnal animal, very fetid ; seldom, though sometimes found with wings ; easily killed when taken alive, and said to be expelled in a variety of ways, viz. by charcoal, and oil of turpentine ; by the *Mentha arvensis*, *Lepidium ruderale*, *Myrica Gale*, *Geranium robertianum*, *Agaricus muscarius*, *cimicifuga* ; the seeds and plant of the Hemp, the berries of the *Opulus*, the *Ledum palustre*, the oil of Tobacco, the smoke of the *Capsicum*, the *Plumbago europæa*, the *Acorus palustris*, the *Melolontha* infused in oil, the *Medusæ*, the *Cimex personatus*, and the *Formica rubra*.

*Cole-*

## CIMEX.

\* † B. *Coleoptrati*.

2. *Cimex littoralis*. Elytra of a dirty grey colour, spotted with white; the wings abbreviated; the body black.

*Inhabits* Europe. B.

Found near the sea shore.

3. *Cimex clavicornis*. Elytra with carinated nerves, and reticulated punctures; the antennæ clavated.

*Inhabits* Europe. B.

Found in gardens.

4. *Cimex Serratulae*. Black; the elytra pale, the wings brown at the points.

*Inhabits* England.Found on the *Serratula arvensis*, or Way thistle.\* † C. *Membranacei*.

5. *Cimex corticalis*. The margin of the abdomen imbricated; the body black.

*Inhabits* Europe. B.

Found on trees in woods.

6. *Cimex lævis*. Black; the abdomen smooth and dark brown; the wings pale.

*Inhabits* England.

7. *Cimex Betulae*. Thorax denticulated, the head mucronated; the elytra dilated on the anterior part.

*Inhabits* Europe. B.

Found on the Birch.

8. *Cimex Filicis*. The apex of the elytra, the head and feet livid; the body black.

*Inhabits* Europe. B.

Found on Ferns.

\* † † A. *Scutellati*.

9. *Cimex nobilis*. Of a gilded greenish colour, with black spots.

*Inhabits* Asia.

Red below; with lateral fasciæ, shining with blue and gold.

10. *Cimex scaraboides*. Body of a black bronze colour.

*Inhabits* Europe. B.Found frequently in the flowers of the *Ranunculus*.

## CIMEX.

11. *Cimex inunctus*. Black, the base of the scutellum and feet grey.

*Inhabits* England.

\* † † B. *Spinosi*.

12. *Cimex rufipes*. Ovate and grey; the thorax obtusely spined; the feet red. (Plate VIII. fig. 5.)

*Inhabits* Europe. B.

13. *Cimex luridus*. The thorax obtusely spined and greenish; elytra grey, with a brown spot; the clypeus emarginated.

*Inhabits* England.

14. *Cimex marginatus*. Thorax obtusely spined; the abdomen marginated and acute; the antennæ red.

*Inhabits* Europe. B.

15. *Cimex haemorrhoidalis*. Ovately oblong and grey; the thorax acutely spined; antennæ black; the sternum stretched forwards.

*Inhabits* Europe. B.

\* † † C. a. *Rotundati*.

16. *Cimex griseus*. Grey, the sides of the abdomen variegated with black and white; the wings clouded, the sternum projecting.

*Inhabits* Europe. B.

17. *Cimex Baccarum*. Of a colour inclining to tawny; the margin of the abdomen spotted with brown.

*Inhabits* Europe. B.

Found on Goose-berries, Strawberries, &c. to which it sometimes communicates its own disagreeable smell.

18. *Cimex juniperinus*. Somewhat round and green; the whole margin and the apex of the scutellum yellow.

*Inhabits* Europe. B.

Found on the Juniper.

19. *Cimex prasinus*. Nearly round, and wholly green; the scutellum of the same colour.

*Inhabits* Europe. B.

Found in woods, in summer.

## CIMEX.

20. *Cimex cæruleus*. Of a blue colour, not spotted.  
*Inhabits* Europe. B.  
 Antennæ and feet black ; wings brown.
21. *Cimex melanocephalus*. Nearly round and grey ; the head and the base of the scutellum of a blackish bronze colour.  
*Inhabits* Europe. B.
22. *Cimex oleraceus*. Of a bluish bronze colour, the thorax with a red or white line, the apex of the scutellum, and the elytra with a red or white spot.  
*Inhabits* Europe. B.  
 Found on the tetradynamious plants, chiefly ; the scutellum sometimes dark green.
23. *Cimex bicolor*. The elytra variegated with black and white ; the wings white.  
*Inhabits* Europe. B.  
 Found in gardens in the spring.
24. *Cimex festivus*. Variegated with black and red ; the thorax with six black dots ; the wings brown ; the margin whitish.  
*Inhabits* North America, Calabria, &c. B.  
 Has been found in England, in June ; but is not common.
25. *Cimex acuminatus*. Oval, attenuated before ; of a light ash-colour ; the antennæ bright red.  
*Inhabits* Europe. B.  
 The abdomen behind is truncated and almost bidentated.
- \* † † C. b. a. *Oblongi*.
26. *Cimex umbratilis*. Black ; the elytra spotted with white.  
*Inhabits* Sweden. B.
27. *Cimex flavicollis*. Black ; the head, thorax, and feet red.  
*Inhabits* England.
28. *Cimex spissicornis*. Black ; the feet yellow ; the antennæ thickest in the middle.  
*Inhabits* Europe. B.

29. *Cimex*

## CIMEX.

29. *Cimex quadrimaculatus*. Yellowish: the thorax with four brown spots.

*Inhabits* Europe. B.

30. *Cimex quadripunctatus*. Head and thorax yellowish orange colour; four distinct black spots, and a transverse band of the same on the latter; legs and body bright orange.

*Inhabits* England.

Given from Donovan. Plate 101. fig. 1. 2. 3. Nearly

allied to the preceding species, if not the same.

31. *Cimex vittatus*. Black; the thorax before and behind, with the scutellum, yellow; the base of the antennæ and the elytra red; the latter with a waved whitish stripe, and bent in at the apex.

*Inhabits* Europe. B.

\* ++ C. b.  $\beta$ .

32. *Cimex crassicornis*. Of a greyish colour with red dots.

*Inhabits* Europe.

\* ++ C. b.  $\gamma$ .

33. *Cimex Hyofscyami*. Variegated with red and black; the wings brown, not spotted.

*Inhabits* Europe. B.

Frequent in April and May, among the leaves of the *Hyo-*  
*scyamus*.

34. *Cimex equestris*. Spotted with red and black; thorax black on the anterior and posterior part; wings black with white spots.

*Inhabits* Europe. B.

Double the size of the preceding species. Found chiefly on the *Asclepias Vincetoxicum*.

35. *Cimex apterus*. Variegated with red and black; elytra red; with two black dots; no wing.

*Inhabits* Europe. B.

A gregarious insect, found in heaps together in gardens, and sometimes on the *Malva sylvestris*. It is found now and then with wings.

## CIMEX.

36. *Cimex pratensis*. Yellowish; the elytra green.  
*Inhabits* Europe. B.
37. *Cimex campestris*. Yellowish; the elytra with a ferruginous spot.  
*Inhabits* Europe. B.
38. *Cimex saltatorius*. Black; the elytra striated; the wings on the posterior part spotted with yellow.  
*Inhabits* Europe. B.
39. *Cimex arenarius*. Black; elytra cinereous; wings white.  
*Inhabits* Europe. B.
40. *Cimex Pini*. Black; elytra brown; with a black rhombic spot.  
*Inhabits* Europe. B.  
Found in Fir-woods.
41. *Cimex Rolandri*. Black; the wings with a yellow rhombic spot.  
*Inhabits* Europe. B.
42. *Cimex lynceus*. Black; elytra grey; with a black spot at the apex and a white dot.  
*Inhabits* England and Calabria.
43. *Cimex Urticae*. Black; elytra grey; wings white with a black dot.  
*Inhabits* England.  
Found on the Nettle.
44. *Cimex Populi*. Clouded with white and brown.  
*Inhabits* Europe.  
Found on the Aspen.
45. *Cimex Coryli*. Black; the feet and antennæ yellow.  
*Inhabits* Europe. B.  
Found on the Hazel.
46. *Cimex flavo-marginatus*. Black; a longitudinal line on the thorax; scutellum, exterior margin of the elytra, and spot in the apex, yellow.  
*Inhabits* England.  
Found on the Thistle. Given from Donovan, Plate 245.

†† C.

## CIMEX.

\* + + C. b. δ.

47. *Cimex Abietis*. Brown spotted; feet red; thighs thick.

*Inhabits* Europe. B.

48. *Cimex striatus*. Black; elytra striated with yellow and brown; the apex and feet red.

*Inhabits* Europe. B.

49. *Cimex Ulmi*. Of a reddish brown colour above; elytra with blood-red striæ; wings variegated with white and brown.

*Inhabits* Europe. B.

Found on the Elm.

50. *Cimex Gonymelas*. Brown; abdomen red; antennæ annulated with black; knees of the same colour.

*Inhabits* England.

Given from Donovan. Plate 218. It was taken at Darent Wood, in Kent, early in May.

\* + + C. c.

51. *Cimex lacustris*. Black above, depressed, fore legs very short.

*Inhabits* Europe. B.

Frequent in Spring and Summer on still waters.

52. *Cimex stagnorum*. Somewhat cylindrical and black; with two globose dots on the middle of the thorax.

*Inhabits* England.

Found in lakes and on stagnant waters.

53. *Cimex vagabundus*. Grey; the antennæ very short; the feet pale.

*Inhabits* Europe. B.

54. *Cimex pallescens*. Upper and under wings very pale; brownish colour; thorax and body pale yellow, with two faint crimson longitudinal streaks from the antennæ to the extreme part of the body.

*Inhabits* England.

From Donovan. Plate 101. fig. 5, 6. Found in June and July.



## APHIS.

mentioning the plants on which they are found. It is believed that the following are natives of Britain.

1. Aphis *Ribis*. The Aphis of the red Currant.
2. A——*Ulm*i. The A of the Elm.
3. A——*Prun*i. The A of the Plumb.
4. A——*Sambuci*. The A of the Elder.
5. A——*Prun*i *cerast*i. The A of the Cherry.
6. A——*Rumicis lapathi*. The A of the Dock.
7. A——*Acetosa*. The A of the Wild Sorrel.
8. A——*Ligustici scotici*. The A of the Lovage.
9. A——*Lychnidis*. The A of the *Lychnis dioica*.
10. A——*Caprea*. The A of the Willow.
11. A——*Padi*. The A of the Bird-cherry.
12. A——*Rosa*. The A of the Rose.
13. A——*Aegopodii podagrariae*, The A of the Bishops-weed.
14. A——*Dauci*. The A of the Carrot.
15. A——*Urticata*. The A of the Nettle.
16. A——*Tibia*. The A of the Lime-tree.
17. A——*Juniperi*. The A of the Juniper.
18. A——*Brassicae*. The A of the Cabbage.
19. A——*Cracca*. The A of the *Vicia Cracca*.
20. A——*Lactuca*. The A of the Lettuce.
21. A——*Sonch*i. The A of the Sow-thistle.
22. A——*Cirsii*. The A of the *Serratula arvensis*.
23. A——*Cardui*. The A of the Thistle.
24. A——*Tanaceti*. The A of the Tanzy.
25. A——*Absointhii*. The A of the Wormwood.
26. A——*Millefolii*. The A of the Millefoil.
27. A——*Avena sativa*. The A of the Oat.
28. A——*Fraxini*. The A of the Ash-tree.
29. A——*Jacea*. The A of the *Centaurea jacea*.
30. A——*Betula*. The A of the Birch tree.
31. A——*Alni*. The A of the Alder.
32. A——*Fagi*. The A of t

## PHIS.

33. *Aphis Quercus*. The A of the Oak ; with a very long proboscis.
34. A—*Pini*. The A of the Scotch Fir.
35. A—*Salicis*. The A of the Willow.
36. A—*Populi*. The A of the leaves of the Aspen.
37. A—*Tremula*. The A of the young branches of the Aspen.
38. A—*Viburni*. The A of the Way-faring tree.
39. A—*Mali*. The A of the Apple.
40. A—*Bursaria*. The A of the Black Poplar.
41. A—*Aceris platanoides*. The A of the Maple.
42. A—*Atriplicis*. The A of the Orach.
43. A—*Plantaginis*. The A of the Plantain.
44. A—*Leucanthemi*. The A of the Ox-eye daisy.
45. A—*Scabiosæ*. The A of the Scabious,
46. A—*Fabæ*. The A of the Bean.

EN. LXVII. CHERMES. The rostrum rising from the breast with a vagina, and three inflected setæ. Antennæ cylindrical, longer than the thorax ; wings four, deflected ; thorax gibbous ; feet formed for leaping.

The larvæ of the insects of this genus are furnished with feet, and generally covered with down. The perfect insects leap ; they sit on plants ; in other respects are like the Aphides. Linnæus has described only one or two ; mentioning merely the plants they feed on, and, as these are all inhabitants of Britain, we shall enumerate his whole species.

- |                                 |                                      |
|---------------------------------|--------------------------------------|
| 1. <i>Chermes Graminis</i> .    | <i>Chermes</i> of the Aira flexuosa. |
| 2. C— <i>Ulmæ</i> .             | C of the Elm tree.                   |
| 3. C— <i>Cerastii</i> .         | C of the <i>Cerastium viscosum</i> . |
| 4. C— <i>Pyræ</i> .             | C of the Pear.                       |
| 5. C— <i>Sorbi</i> .            | C of the Mountain Ash.               |
| 6. C— <i>Amygdali Persicæ</i> . | C of the Peach.                      |
| 7. C— <i>Calthæ</i> .           | C of the Marsh Marygold.             |

8. *Chermes*

## CHERMES.

- |                            |   |
|----------------------------|---|
| 8. Chermes <i>Buxi</i> .   | C of the Box-wood.  |
| 9. C— <i>Urticae</i> .     | C of the Nettle.  |
| 10. C— <i>Betulae</i> .    | C of the Birch.   |
| 11. C— <i>Alni</i> .       | C of the Alder.   |
| 12. C— <i>Quercus</i> .    | C of the Oak.   |
| 13. C— <i>Fagi</i> .       | C of the Beech.   |
| 14. C— <i>Abietis</i> .    | C of the Pinus Abies.   |
| 15. C— <i>Salicis</i> .    | C of the Willow.  |
| 16. C— <i>Fraxini</i> .    | C of the Ash.   |
| 17. C— <i>Acëris</i> .     | C of the Mapple.  |
| 18. C— <i>Ficus</i> .      | C of the Fig.   |
| 19. C— <i>Pini</i> .       | C of the Fir.   |
| 20. C— <i>Pruni</i> .      | C of the Plumb.   |
| 21. C— <i>Cratagi</i> .    | C of the White thorn.   |
| 22. C— <i>Euonymi</i> .    | C of the Spindle tree.  |
| 23. C— <i>Senecionis</i> . | C of the Groundfel.   |
| 24. C. <i>Lichenis</i> .   | Brown, spotted with black; the antennæ longer than the body; the wings with nerves and brown spots. Found on Lichens. |
| 25. C. <i>castanea</i> .   | Brown; antennæ setaceous and smooth; wings with nerves. Found on various plants.                                      |
| 26. C. <i>rubra</i> .      | Red; the wings with nerves. Found on various plants.  |

GEN. LXVIII. COCCUS. The rostrum rising from the breast, with a vagina and setæ. Antennæ filiform. Abdomen with bristles behind. Two erect wings in the males; the females without wings.

The insects of this genus are the pests of the Hot-house, and other Conservatories of Plants; the young run up and down the branches and leaves of trees, and they fly by leaps; they undergo a certain degree of metamorphosis; but the Cœci *Atonidum*, *polemicus*, *spurius*, *Cæti*, *Phalaridis*, *Pilosellæ*, *Uva ursi*, and *Alni*, scarcely change their appearance; the grown ones, the females especially, which are many times larger than the males, are furnished with black eyes, antennæ, and very small feet; they are so fertile, that a single female contains about a thousand ova; they move slowly; adhere closely

## COCCUS.

closely to the plant, some to the branches, others to the roots, and, in general, hardly move from the spot to which they are attached.

1. *Coccus hesperidum*.      The Coccus of Conservatories.  
*Inhabits* hot-houses, &c. on the Evergreens, such as the  
*Citrus, Laurus, Quassa, &c.* of a reddish-brown  
colour, and of an ovate-oblong shape.
2. *Coccus Quercus*.      The C. of the Oak.
2. C — *Betulae*.      The C. of the Birch.
4. C — *Carpini*.      The C. of the Hornbeam.
5. C — *Ulm*.      The C. of the Elm.
6. C — *Coryli*.      The C. of the Hazel.
7. C — *Tiliae*.      The C. of the Lime.
8. C — *Capreae*.      The C. of the Willow.
9. C — *Salicis*.      The C. of the *Salix hermaphrodita*
10. C — *polonicus*.      The C. of the *Scleranthus perennis*
11. C — *Fragariae*.      The C. of the Strawberry.
12. C — *Pilosellae*.      The C. of the *Hieracium pilosella*
13. C — *Uva ursi*.      The C. of the *Arbutus Uva ursi*.
14. C — *Phalaridis*.      The C. of the Canary grass.
15. C — *Oxyacanthae*.      The C. of the White thorn.
16. C — *Serratulae*.      The C. of the *Serratula arvensis*.
17. C — *Persicae*.      The C. of the Peach, round.
18. C — *Abietis*.      The C. of the *Pinus Abies*.
19. C — *Mespili*.      The C. of the Medlar.
20. C — *Aceris*.      The C. of the Mapple, ovate.
21. C — *Alni*.      The C. of the Alder.
22. C — *fuscus*.      Brown  
*Inhabits* the Oak, covered with a white down
23. C — *variegatus*.      Round, variegated with white, yellow, and black.  
*Inhabits* the Oak.
24. C — *conchiformis*.      The Coccus of trees, linear.  
*Inhabits* the Elm.      Narrow and brown.

## COCCUS.

25. *Coccus catafractus*. With ferruginous antennæ and legs.

*Inhabits* the Sphagnum palustre, and other mosses.

See Shaw's Naturalists Miscellany, Fasc. 5. Pl. 182. Is it not the same, or a variety of the *Coccus dubius* of Fabricius?

**GEN. LXIX. THRIPS.** Rostrum indistinct, being hid within the mouth. Antennæ filiform, of the length of the thorax. Body linear; abdomen curved upwards. Wings four, straight, lying upon the back, longitudinal, narrow, and somewhat crossed.

The insects of this genus are very small, and live gregariously in the flowers of many plants. They are very agile, and their larvæ, which are generally red, equally so.

1. *Thrips physapus*. Elytra of a glaucous colour; the body black.

*Inhabits* Europe. B.

Frequent on the Compound flowers: it makes those of the *Lotus corniculatus* tumid, and shuts them up; and the spikes of rye inhabited by this insect become quite empty.

2. *Thrips minutissima*. The elytra and body of a glaucous colour; the eyes brown.

*Inhabits* Europe. B.

Found in flowers; frequent in the Carnation.

3. *Thrips juniperina*. Elytra white, body brown.

*Inhabits* Europe. B.

Found in the galls of the Juniper.

4. *Thrips fasciata*. The elytra with white and black transverse stripes; the body brown.

*Inhabits* Europe. B.

Found in the Compound flowers.

## § 258.

## ORDER III. LEPIDOPTERA. \*

THE insects of this Order, the GLOSSATA of Fabricius, which contains the various kinds of Butterflies, Moths, and Hawk-moths, have all four wings, covered with scales or a sort of farina; they have a mouth with palpi, a spiral tongue, and a body set with hairs. The scales resemble feathers; they lie over one another in an imbricated manner, the shaft towards the body of the insect, and the expansion towards the end of the wing; reflecting often the most beautiful colours. The reticulated eyes are large, and besides these, some have two or three small stemmata situated on the forehead. The palpi have from two to three articulations, they are hairy, standing outwards, and sometimes a little upwards. Butterflies, with their spiral tongue, suck the nectarious juices of flowers; but, in general, they need little food; some, indeed, whose tongue is very short, seem to take no nourishment at all. They have, on each side, nine spiracula or organs of respiration, of which, one is situated on the thorax, the other eight on the segments of the abdomen: the last segment is without any, but in it are contained the organs of generation. The principal function of the perfect insect is to propagate its species, for which purpose the female deposits her eggs on such plants, and in such places as afford the proper nourishment to the larvae when excluded; after which both sexes very soon cease to live.

Out of the eggs at length proceed the larvæ, which, in this order particularly, have the name of Caterpillars; they are of a long worm-like figure, with many feet. They have, in general, a heart-shaped head, on each side of which are the eyes, each eye consisting of six small lenses, covered with the common integument; there are likewise short hairs, and horns, of which two are larger than the others, and the foundation of the fu-

P 2

ture

\* From λεπίς a scale, and πτερόν a wing.

ture antennæ. At the mouth are two dentated maxillæ with two simple teeth, from two to four palpi, and the under lip, from which, by means of certain papillæ, the insect draws its threads. (See plate VII. fig. 6. 9.) The elongated body has twelve proper segments, on the sides of which, as in the perfect insect, the spiracula are placed; but the second, the third, and the last segment, have no spiracles. They open into the trachea, which runs along the sides, and is dispersed by many ramifications to every part of the Caterpillar. For the anatomy of a Caterpillar, see that most wonderfully elaborate work, Lyonet's *Traité anatomique de la chenille qui ronge le bois du faule*, Hague, 1762, 4to.

Caterpillars, for the most part, have sixteen feet; some have fourteen, others twelve; the *Geometræ* (Plate VII. fig. 9.) have ten, and the *Tineæ* but eight feet. Those feet are of two kinds; the first six are horny, with three articulations, they end in a point and are situated under the three first abdominal segments: these are common to all Caterpillars, and after transformation they constitute the six feet of the perfect insect. The hinder feet are thick, membranaceous, not articulated, and are thick set on the margins with soft hooks; some of these are often wanting; the two feet at the extremity of the body, are made for holding fast, and with them the Caterpillar often supports itself in a state of repose. The skin of Caterpillars is sometimes naked, sometimes hairy, sometimes set with prickles, which are either simple or branched; sometimes furnished with long hairs, which are either single or in tufts, &c. Some Caterpillars on the last segment are armed with a pretty strong horn.

All Caterpillars are employed solely in taking food, which consists chiefly of leaves, roots, or the wood of plants; sometimes likewise of other insects; they change their skins in general three or four times, and transform themselves into a Pupa obrecta (Plate VII. fig. 7. and 10.) sometimes in a concealed place in the open air, sometimes between leaves, and sometimes in the earth; the *Phalænæ Bombyces* spin a sort of thread or  
filk,

silk, of which they form a case or cocoon, for their convenient repose, during their motionless state of Pupa. At last the perfect insect bursts its prison, having lain in that state a longer or shorter time, and when it first appears, the developement and growth of the parts are very visible. During this progress the insect discharges some drops of a reddish fluid, which, when in great quantities in one place, as sometimes happens, has given occasion to the fable of showers of blood. Of the larvæ and pupæ of the insects of this Order, the Ichneumonids are particular enemies.

**GEN. LXX. PAPILIO.** Antennæ growing thicker at the extremities, in general club-shaped or capitated. Wings, when at rest, erect, and meeting upwards. Flying by day.

This genus comprehends those insects called in English Butterflies, which fly in the day. The first pair of legs in some of them, are short, and used rather as hands for cleaning themselves, than as feet for walking. Their flight is in general quick. The Caterpillars have all sixteen feet, and are for the most part prickly; some, however, are smooth, others set with short hairs, others have a sort of tail, and some on the head have two blunt horn-like feelers. (Plate VII. fig. 6.) They change in the open air, without spinning, into a cornered pupa, which, as it sometimes has a metallic lustre, is, in this genus peculiarly, termed *chrysalis*. This is attached by the tail to some wall or shaded place; or it is fixed by a thread round the middle, the ends of which are made fast to the wall. In this state it remains generally about three weeks, when the perfect insect appears. Some, during the summer, produce two or three broods; the last remains, during the winter, in the chrysalis state, and the insect appears early in the Spring.

Linnaeus divides this genus, which contains 877 species, into six families; the names of the first, being mostly exotic, he has taken from the Trojan and Grecian chiefs; those of the others, as most of them are European, and their history and manner better known, are taken chiefly from the plants on which the Caterpillars feed.



I. **EQUITES.** Those whose upper wings are longer from the posterior angle to the apex, than from the same angle to the base; their antennæ are often filiform.

A. *Troës*; often black, with bloody spots on the breast.

B. *Achivi*; without the bloody spots; an ocellus at the angle of the anus.

II. **HELICONII.** With quite intire and narrow wings, which are sometimes naked, especially towards the extremities; the upper ones oblong; the under ones very short.

III. **PARNASSII.** With quite intire wings; the upper ones rounded.

IV. **DANAI.** With intire wings.

A. *Candidi*; with white wings.

B. *Festivi*; with wings variously coloured.

V. **NYMPHALES.** With indented wings.

A. *Gemmati*; the wings ocellated.

a. Ocelli in all the wings.

b. — in the upper wings.

c. — in the under wings.

B. *Phalerati*; the wings without ocelli.

VI. **PLEBEII.** Small; the larva generally contracted.

A. *Rurales*; the wings with obscure spots.

B. *Urbicolæ*; the wings with spots which are often pellucid.

\* *Equites.*

## PAPILIO.

\* *Equites.*A. *Trocs.*

1. *Papilio Hector.* Wings black; of the same colour above and below; on the anterior wings a white fascia; red spots on the hinder ones.

*Inhabits India.*

The Caterpillar feeds on the plants of the genus *Aristolochia*; the white fascia on the anterior wings consists of eight oval bifid spots; the spots on the under wings are deep red, lunated, with the convexity towards the head, and form a double arch.

2. *Papilio Priamus.* With denticulated filky wings, the anterior ones green above, with a black spot; the posterior ones with six black spots.

*Inhabits Amboina.*

For size and beauty the first of this genus; the head and feet are black; the abdomen bright yellow; the sides of the thorax variegated with transverse red lines.

B. *Achivi.*

3. *Papilio Agamemnon.* Wings black, spotted with green; the hinder ones with a lunated ocellus, and red spots on the under surface.

*Inhabits Asia.*

4. *Papilio Machaon.* The Swallow-tail B. Wings yellow above and below; the border brown, with yellow lunulated spots; a reddish or tawny spot on the interior angle of the posterior wings.

*Inhabits Europe. B.*

The Caterpillar of this species is found on Rue and the umbelliferous plants; it is smooth, with alternate green and black rings, the black ones with red dots; it has two yellow, short tentacula, which discharge a fetid odour, that keeps the ichneumons at a distance; the pupa is yellowish. The first brood of the insect appears in May; the second towards the end of July.

5. *Papilio Podalirius.* Scarce Swallow-tail B. Wings yellowish above and below, with brown fasciæ, doubled; the posterior ones below with a red line.

*Inhabits Europe, the North of Africa, &c. B.*

The

## PAPILIO.

The Caterpillar feeds on the Cabbage; it is yellowish, with brown spots; the head of a pale green; the pupa yellowish, spotted with brown; bidentated before. This, with the former species, are called in English, Swallow-tailed Butterflies, and are the only Equites that are found in Britain, or, indeed, in Europe.

**\*\* *Heliconii.***

6. *Papilio Ricini.* Wings brown; the anterior ones with two yellow fasciæ on both sides; the posterior ones radiated at the base.

*Inhabits America.*

The Caterpillar feeds on the *Ricinus Palma Christi*; the base of the posterior wings in the male is purple; in the female blue.

There is no European species of this section.

**\*\*\* *Parnassii.***

7. *Papilio Cratægi.* The black-veined white Butterfly. Wings white, with black veins.

*Inhabits Europe. B.*

The Caterpillars live in society on fruit trees; they are hairy and yellowish; they live during the winter rolled up in dry leaves, and come out early in spring to feed on the young foliage. About the end of May they go into the pupa state, in which they remain for three weeks, when the perfect insect appears.

**\*\*\*\* *Danai.***

*A. Candidi.*

8. *Papilio Brassicae.* Great white Cabbage B. The anterior wings with two spots and the apex black. Large.

*Inhabits Europe. B.*

The anterior wings of the male want the black spots on the upper surface, as in the *Rapæ* and *Napi*. The larva is well known, it feeds on the Cabbage; it is of a cinereous colour with black spots, marked with three light yellow lines; the tail black; the pupa is pale greenish, with three yellow lines, and three gibbous segments. The eggs are deposited in clusters; they are erect, and obtuse.

9. *Papilio Rapæ.* Small white Cabbage B. The anterior wings with two spots and the apex black. Small.

*Inhabits Europe. B*

The

**PAPILIO.**

The larva is green ; with a bronze dorsal line, and bronze spots on the sides ; the pupa is gibbous and greenish ; with three sulphureous lines.

10. *Papilio Napi*. Green veined white B. Wings with greenish dilated veins on the under surface.

*Inhabits* Europe. B.

11. *Papilio Sinapis*. White wood B. Wings rounded ; brownish at the apex.

*Inhabits* Europe. B.

These four species are exceedingly destructive to Cabbage and other plants of that kind, which they render very unfightly in the kitchen garden.

12. *Papilio Daphidice*. Bath-white B. Wings rounded, with a brown margin ; greyish yellow below, with white spots.

*Inhabits* Southern Europe, Africa, &c. B.

This species has been found in England, in the neighbourhood of Bath only. The Caterpillar feeds on the Refeda, the Cabbage, &c. ; it is hairy, and of a bluish colour, marked with black dots and yellow striz.

13. *Papilio Cardamines*. Orange-tip B. With rounded wings ; the primary wings orange from the middle ; the posterior wings marbled with green underneath.

*Inhabits* Europe. B.

The wings of the female are wholly white above. The larva is green above, whitish below ; the pupa green, with a white line on the sides ; the thorax conical and turning up. The Caterpillar is found in June and July, on the Cardamine, Brassica and Thlaspi, when it changes to a chrysalis, in which state it remains till the succeeding May, when the perfect insect appears.

14. *Papilio Edufa*. Clouded orange B. Wings orange, with a spot and the margin black ; greenish on the under side, with a black spot on the anterior, and a silvery spot on the posterior wings.

*Inhabits* Spain, &c. B.

15. *Papilio Hyale*. Clouded yellow B. Wings rounded and yellow ; an orange spot on the posterior wings, with a small doubled silvery spot on the under side.

*Inhabits* Europe, Africa, &c. B.

## PAPILIO.

The Caterpillars of this species and the foregoing are little known. The fly is found in August.

16. *Papilio Rhamni*. Brimstone B. With yellow angulated wings; in each a ferruginous spot.

*Inhabits* Europe, Africa, &c. B.

The Caterpillar feeds on the Buckthorn; it is smooth and green, with a darker line along the back; the pupa is gibbous, acuminate before, suspended in a vertical position on a perpendicular branch, with a thread of silk wound round its middle as a support. The Butterfly is found from April to June. When produced in August, it remains during the winter, and appears early in spring. The male is of a sulphur colour, the female white.

B. *Festivi*.

17. *Papilio Hyperanthus*. Eyed brown B. Wings intire and brown; on the under side of the anterior wings three ocelli; on the posterior wings two or three.

*Inhabits* Europe. B.

The Caterpillar is solitary, villous and cinereous, with a black line on the hinder part; the anus bidentated; it feeds on the roots of the *Poa annua*; the pupa is gibbous and brown, with yellow spots. The Butterfly is very common from the end of June.

18. *Papilio Pamphilus*. Small heath B. Wings intire and yellow; with one ocellus on the under side of the anterior wings; the posterior wings ash-coloured, with a fascia and four obliterated ocelli.

*Inhabits* Europe. B.

The Caterpillar feeds on the *Cynofurus cristatus*, in meadows and woods; it is green with a whitish line along the back; the pupa is green. The Butterfly is very frequent during the whole summer.

19. *Papilio Hero*. Scarce meadow brown B. Wings intire and tawny; an ocellus on the under side of the anterior wings; six on the posterior.

*Inhabits* Europe. B.

Found in meadows and woods; but not common; it is very abundant in some marshy places of Lancashire, near Manchester, &c. in July.

*Nym:-*

## PAPILIO.

\*\*\*\*\* *Nymphales.**A. Gemmati.*

20. *Papilio Io*. Peacock B. With angulated and indented wings of a dun red colour spotted with black; a blue ocellus on each.

*Inhabits Europe B.*

The Caterpillars are found on the hop and the nettle; they are gregarious; set with spines; black with white spots; the hinder feet ferruginous. They inclose themselves in a web, drawing at the same time the leaves together to cover them; they change their colour every time they change their skin, and make a web each time at a distance from their former residence; when in their last skin, they forsake the web, and feed separately; the pupa is greenish yellow, with ten dents, and bifid behind; it undergoes this change the first week of July and remains in it three weeks, when the Butterfly appears.

21. *Papilio Mæra*. Great Argus B. With brown indented wings; on both sides of the upper wings a sesqui-ocellus; on the upper side of the posterior wings, three ocelli, on the under side six.

*Inhabits Europe. B.*

The Caterpillar feeds on grasses; it is somewhat villous, greenish, with its tail bidentated; the pupa is greenish, obtusely bifid, and prickly on the sides. The Butterfly appears from May to August, and settles on dry banks and walls.

22. *Papilio Megaera*. Large Gate-keeper. Wings indented, yellowish, with brown fasciæ; one ocellus on the anterior wings; on the posterior five above and six below.

*Inhabits Europe. B.*

The Caterpillar is villous and green, with pale streaks; the tail bifid; it feeds on grasses: about the middle of July it is at full growth; it then changes to a Chrysalis, and in three weeks the Butterfly is bred, and deposits its eggs, which produce Caterpillars that live over the winter, and turn to flies in May and June.

23. *Papilio Aegeria*. Wood Argus B. Wings indented, brown, with yellow spots; on both sides of the anterior wings, an ocellus; on the posterior wings four ocelli above, and four dots below.

*Inhabits Europe. B.*

## PAPILIO.

The Caterpillar is green with a whitish or yellow line; the tail bifid; it feeds on grasses; the pupa short, thick and greenish; the Butterfly is found in woods from May to August; there being three broods of it in the season.

24. *Papilio Galathea*. Marble B. Wings indented, variegated with black and white; on the under side of the anterior wings, a single ocellus; on the posterior five obsolete ones.

*Inhabits Europe.* B.

The Caterpillar is sometimes green, sometimes yellow, with lines of a darker colour; above the tail are two short red spines; the back is set with very short hairs; it feeds on grasses, and changes into a naked gibbous pupa, somewhat round like that of a *Phalæna*. The Butterfly appears in July and continues to September; it is found in meadows and grassy places in woods.

25. *Papilio Semele*. Black eyed Marble B. Wings indented, brown, with a tawny fascia; the posterior wings variegated with black and white.

*Inhabits Europe.* B.

Found in woods; but not very common. The Caterpillar feeds on grass, lying close to the roots in the day-time. It rarely ventures out to feed except in the evening for fear of birds, which are always searching for this kind of Caterpillar. When going into the chrysalis state it unites several blades of grass together by a web, and suspends itself by the tail in the centre, so that it hangs an inch or two from the ground. The butterflies are on the wing in the end of June or beginning of July.

26. *Papilio Jurtina*. Meadow brown B. Wings indented, brown; the anterior wings with a yellow spot and an ocellus on both sides; the under wings with a spot.

*Inhabits Europe.* B.

The Caterpillar is villous and green, with a white line on the sides; the tail bifid; and feeds on grasses; the pupa is yellowish. The Butterfly is very common.

27. *Papilio Janira*. Three dotted Meadow brown B. Wings indented, brown; the primary wings yellowish

**PAPILIO.**

ish below, with a single ocellus; the posterior wings with three dots on the under side.

*Inhabits* Europe. B.

This is said by Lewin to be the male of the preceding species. The Butterfly is on the wing the first week in June.

28. *Papilio Cardui*. Painted Lady B. Wings orange, indented; variegated with black and white spots; four ocelli on the under side of the posterior wings.

*Inhabits* Europe and Africa. B.

The Caterpillar is solitary, brown and thorny; with yellow interrupted lines along the sides; it feeds on thistles, and is found the whole summer over till late in autumn; the pupa is brown; with cinereous lines and gold spots; in two or three weeks after going into the chrysalis state the butterfly appears. It lays a single egg on one leaf, and the caterpillar when bred covers itself with a thin web, almost uniting the upper edges of the thistle leaf together, and feeding on the upper surface.

29. *Papilio Iris*. Purple Emperor B. Wings indented, brownish, shining with blue or purple; on both surfaces a whitish interrupted fascia and a single ocellus; that on the upper wings wanting the pupil. (Plate VII. fig. 8.)

*Inhabits* Europe. B.

The Caterpillar feeds on the Oak, the Willow, and the Ash, generally on the highest branches; it is rough and green with white oblique lines; on the head are two spines; the pupa is compressed and greenish with two horns. The insect is in Caterpillar about May and June, and in July and August the Butterfly is found. On the upper wings are seven distinct white spots; on the under an irregular broad white stripe and a red ocellus. Beneath, the wings are variegated with black, brown, and white. Its flight is high and rapid.

B. *Phalerati*.

30. *Papilio Populi*. Wings indented, brown, with white spots and fasciæ; below yellowish, with white fasciæ and blue spots.

*Inhabits* Europe. B.

The Caterpillar is found on the Aspen: it is variegated and



## PAPILIO.

and spiny, the head and tail orange coloured ; the pupa yellowish with black spots ; gibbous behind. The Butterfly is found in July but is not common.

31. *Papilio Antiopa*. Willow B. Wings angulated and black ; the border whitish.

*Inhabits* Europe and America. B.

The Caterpillar is gregarious, black, and spiny ; with square ferruginous spots along the back ; it is found on the Birch and the Willow ; the pupa is black with dents and tawny spots. The Butterfly appears early in Spring ; the white border of the wings grows yellow in Summer. It is not a common insect in England.

32. *Papilio polychloros*. Great Tortoise-shell B. Wings angulated tawny with black spots ; the anterior ones on the upper side with four black dots.

*Inhabits* Europe. B.

The Caterpillar is gregarious, spiny, and blackish, with a yellow lateral line : it feeds on the Elm, and fruit trees ; the pupa is reddish. The Butterflies appear in July ; but the later brood sometimes pass the winter and appear in March. They fly swift, and delight to settle in dry path-ways and on the trunks of trees to sun themselves.

33. *Papilio Urticæ*. Tortoise-shell B. Wings angulated and tawny, with black spots ; the anterior ones on the upper side with three black dots.

*Inhabits* Europe. B.

The Caterpillar is gregarious, spiny, dark-coloured, sometimes with a tinge of green ; the head is black ; it feeds on the nettle ; the chrysalis is brownish, with dents, and gold coloured spots at the neck ; and sometimes altogether gilded. They may be found in June, hanging by the tail attached to the leaves or stalks of the nettle. The butterfly is very common, lives over the winter, and comes abroad early in the spring on a good day, whence Linnæus calls it, *fallax veris indicium*.

34. *Papilio C album*. White c B. Wings angulated and tawny, with black spots ; the posterior ones marked on the under side with a white c.

*Inhabits* Europe. B.

The Caterpillar is solitary, spiny, and tawny ; the back yellow before, white behind ; the pupa is reddish, contracted  
in

## LEPIDOPTERA.

17

### PAPILIO.

in the middle, with gilded points. Found on the Nettle, the Hop, the Willow, and the Currant. The butterfly is found from June to September.

35. *Papilio Atalanta*. Admirable B. Wings indented, black with white spots; a purple fascia on the upper wings, and another on the margin of the under wings.

*Inhabits* Europe, Asia, and America. B.

The Caterpillar is solitary, spinous and greenish, with a yellowish lateral line; it feeds on the nettle; and draws the leaf close round it, to protect itself against the injuries of the weather, and the ichneumon fly; when the leaf is exhausted it changes its skin, shifts to another leaf, and webs that together as before. When it has grown so large that one leaf will not cover and feed it, it creeps to the top of the nettle, webbing itself up within the leaves and feeding as before. At the end of July, it fastens itself by the tail, within the web, under the nettle tops, and changes to a chrysalis: the pupa is dentated, blackish, and below cinereous, with gilded dots. In fourteen days after becoming a chrysalis, which happens in August, the butterfly appears: it lives through the winter.

36. *Papilio Sibilla*. White Admirable B. Wings indented, above brown, below ferrugineous with black spots; on each a white fascia composed of spots both above and below.

*Inhabits* Europe. B.

37. *Papilio Camilla*. Blue spotted Admirable B. Wings indented, black, with shining blue spots, a fascia of white spots on both sides; the hinder wings on the under side silvery at the base, without spots.

*Inhabits* Austria. B.

These two Butterflies exceedingly resemble each other; and there has been a confusion among Entomologists arising from their similarity in applying the trivial names. Both of them however seem to be English insects, though very rare. One of them has red spots at the posterior angle of the wings, and is figured by Donovan Plate 244; the other is described by Ray, Hist. Insect. pag. 127. n. 3. Perhaps after all they may be but varieties of the same insect, which

will

## PAPILIO.

will be determined when the Caterpillars of both are known. The Caterpillar of one, which feeds on the Honeyfuckle, has been figured and described by Fuefsly in his Entomological Magazine; it is yellowish-green above, below ferruginous; which colours are separated by a white line. On the 2d, 3d, 5th, 10th, and 11th segments, it has two horns, and on the other segments, two red warts. The pupa is brownish, black, and gibbous.

38. *Papilio Lucina*. Small Fritillary. Wings indented, brown, with tawny spots; two fasciæ of whitish spots on the under side of the posterior wings.

*Inhabits* Europe. B.

Among the smaller Butterflies; found in the middle of May; it feeds on grasses.

39. *Papilio Maturna*. Heath Fritillary. Wings indented, reddish brown, with black spots; the posterior wings with yellow fasciæ underneath, and black waved streaks.

*Inhabits* Europe. B.

The Caterpillar is black spotted with white and spiny; the spines yellowish; it is found among heath and on the plantain; about the middle of May it changes to a chrysalis, and in fourteen days the butterfly appears.

40. *Papilio Cinxia*. Plantain Fritillary. Wings indented, tawny, spotted with black; the posterior wings with three whitish fasciæ and black spots.

*Inhabits* Europe. B.

The Caterpillar is blackish and spiny; the lines of spines alternately white and red; it feeds on the *Hieracium pilosella*, and plantain; and is of a very timorous nature; for if you touch the leaf it is upon, it immediately quits its hold and falls to the ground, where it lies in a curled up form. The Butterfly is swift in flight, and appears in May, but is not common.

41. *Papilio Dictynna*. Heath Fritillary. Wings denotated, black, with tawny spots; the posterior wings tawny, with spots at the base; a fascia of spots in the middle, and lunulated yellow spots at the apex.

*Inhabits* Europe. B.

The Caterpillar feeds on Heath; it remains fourteen days  
in

**PAPILIO.**

in the chrysalis state, and, in June the Butterfly is found in the open parts of woods and dry places, in the neighbourhood of heath.

41. *Papilio Dia*. Wings tawny with black spots; the posterior wings purplish below, with yellow and silvery spots at the base, and a silvery obsolete fascia in the middle.

*Inhabits Europe.* B.

Larger than the *Lucina*, but less than the *Cinnia*, which it resembles in the upper surface of the wings. The Caterpillar feeds on the *Viola*; it is grey, with alternate rows of white and ferruginous spines; the pupa yellowish variegated with black.

42. *Papilio Paphia*. Great Fritillary. Wings indented, tawny, with black spots; silvery fasciae below.

*Inhabits Europe.* B.

Among the largest of the British Papilios. The Caterpillar feeds on the *Viola canina* and nettle; it is solitary, spinous and tawny, with a yellow dorsal line; the spines on the neck longer than the rest; the pupa is grey, contracted at the neck; with six dents, and four dots on the anterior part, of a gold colour. The Butterfly appears in June, on the sides of woods; it is swift in flight.

43. *Papilio Aglaja*. Great silver spot Fritillary. Wings indented, tawny, with black spots; twenty one silvery spots below.

*Inhabits Europe.* B.

The Caterpillar is solitary, black, and spiny, with square ferruginous spots on the sides; the pupa is brown. The Butterfly much resembles the following species, but the Caterpillar differs.

44. *Papilio Adippe*. High brown Fritillary. Wings indented, tawny, with black spots; 23 silvery spots on the under side.

*Inhabits Europe.* B.

The Caterpillars are cinereous or brown; with numerous red spines, with a black dorsal line close to a white one; they feed on the *Viola odorata* and *V. tricolor*; they are produced from the egg in July, and feed till September, when they spin a fine web, at the root of their food, close to the ground, and under this cover they pass the winter. In spring they begin again to feed, and, in the beginning of June, the

## PAPILIO.

change to a chrysalis, which is brown with silvery dots, remaining three weeks, when the fly appears.

45. *Papilio Lathonia*. Lesser silver spotted Fritillary. Wings indented, yellowish, with black spots; with 37 silvery spots underneath.

*Inhabits* Europe. B.

The Caterpillar is spiny and brownish with black spots and a white dorsal line; the pupa is crenated, brown on the fore part, greenish behind. The Butterfly is very rare.

46. *Papilio Euphrosyne*. April Fritillary. Wings indented, tawny, with black spots; nine silvery spots on the under side.

*Inhabits* Europe. B.

The Caterpillar feeds on the *Viola montana*; it is black and spiny; with two orange coloured spots on the back, at each segment. The butterfly is marked with a black dot at the base of the posterior wings. It appears early in April.

47. *Papilio Niobe*. Pale spotted Fritillary. Wings indented, tawny, with black spots; pale spots underneath, and four ocellated silvery spots.

*Inhabits* Europe. B.

The Caterpillar feeds on the *Viola tricolor*; it is very spiny, and brown, with elongated spots; the spines are whitish. The pale spots on the Butterfly are sometimes silvery.

\*\*\*\*\* *Plebeii*.

A. *Rurales*.

48. *Papilio Betula*. Brown hair-streak B. Wings with a small tail; brown; below yellowish; the posterior wings with two white streaks.

*Inhabits* Europe. B.

The Caterpillar is green, broad, and flat, with two white lines on the back, and white oblique and transverse striae on the sides; it feeds on the Birch, Alder, and Sloe; the pupa is smooth and ferruginous. The Caterpillar changes to a chrysalis the first week in July, and the Butterfly appears in August: the male is distinguished by a fulvous spot on the anterior wings.

49. *Papilio Quercus*. Purple hair-streak B. Wings with a short tail, bluish; beneath cinereous, with a white

## PAPILIO.

white streak, and a double tawny dot at the posterior angle.

*Inhabits* Europe. B.

The Caterpillar is thick and gross, of a rose colour above, with three lines of green dots : it feeds on the Oak ; the pupa is smooth and ferruginous, with three lines of brownish dots on the back. The Butterfly is found in Oak woods in June and July.

50. *Papilio Arion*. Mazarine-blue B. Wings without tail, brown above ; the disc blue, with black spots ; beneath grey, with ocellated dots.

*Inhabits* Europe. B.

This species is very rare ; it is found in Pine forests ; there are ten ocelli in the under side of the posterior wings, besides the spots on the margin.

51. *Papilio Argus*. The blue Argus B. Wings without tail, and blue ; the posterior wings with a ferruginous border on the under side, and bluish silvery ocelli.

*Inhabits* Europe. B.

The Caterpillar, which has been seldom found, lives on the Rhamnus and the Genista germanica ; it is green, with a brown line along the back ; the head and the anterior feet black. The Butterfly appears in June. Of this there are several varieties. The wings of the male are of a fine blue, of the female a dull brownish black marked with a row of brown spots near the margin ; on the underside are brown spots, and white, not ocellated.

52. *Papilio Artaxerxes*. Upper wings dark, with a white spot, the under wings with silvery ocelli.

*Inhabits* Europe. B.

Like the preceding species ; but with fewer spots underneath ; it is perhaps but a different sex.

52. *Papilio Corydon*. The Chalk-hill blue B. Wings intire, and of a silvery blue colour ; the margin black ; below cinereous with ocellated dots ; on the under side of the posterior wings a white spot in the center.

*Inhabits* Germany. B  
R 2

This

## PAPILIO.

This insect has been found on the chalk-hills between Dartford and Rochester; it appears in the first and second week of July.

53. *Papilio Adonis*. Cliden blue B. Wings blue and intire; with a black marginal streak, cinereous underneath, with numerous ocellated dots; the posterior wings with a white central spot.

*Inhabits* Europe. B.

Perhaps but a variety of the Corydon.

54. *Papilio Argiolus*. Azure blue B. Without tail, the wings blue above, with a black margin; bluish below, irregularly dotted with black.

*Inhabits* Europe. B.

The upper wings have a transverse line of black dots near the margin. The Butterfly is found in July.

55. *Papilio Alfus*. Small blue B. Wings intire, brown. not spotted; cinereous underneath; with a streak of ocellated dots.

*Inhabits* Europe. B.

Less than the foregoing species.

56. *Papilio Rubi*. The green B. Wings with a small tail, brown above, green below.

*Inhabits* Europe. B.

The larva is green, variegated with yellow; the head black; it feeds on the buds and blossoms of the black-berry, and other Rubi; it changes to a chrysalis in the middle of July, and the perfect insect appears in April or May following.

57. *Papilio Phlaeas*. Common copper B. Wings nearly intire, orange coloured, with black dots; greyish underneath.

*Inhabits* Europe. B.

The wings have the appearance of satin; the black spots on the anterior ones appear on the under side; the posterior ones have a small dent like a tail. The insect appears in June, July, and August. The Caterpillar is not known.

58. *Papilio Vinyaurcae*. Scarce Copper B. Wings somewhat angulated and tawny, brown on the margin; with black and white spots on the under side.

*Inhabits* Europe. B.

The

**PAPILIO.**

The Caterpillar is green, with a yellowish line along the back, and a paler line on the sides; the head black; it feeds on the *Rumex acutus*, and the *Solidago Virgaurea*. The Butterfly is found in July, but is not common: the wings of the female are spotted with black on the upper side.

59. *Papilio Hippothoë*. Great Copper B. Wings intire, with a white margin; the under side cinereous, with numerous ocellated dots.

*Inhabits* Europe. B.

This insect is also uncommon. It is found in meadows, the female is larger than the male, and has a greater number of black spots.

B. *Urbicolae*.

60. *Papilio Comma*. The Comma B. Wings intire, divaricated and tawny, with a black line; white dots on the under side.

*Inhabits* Europe. B.

The Caterpillar is of a shining red colour; the head black, with a white streak at the neck; the pupa is elongated, cylindrical, and brown. The female Butterfly wants the black line.

61. *Papilio Linea*. Small Skipper B. Wings intire, divaricated, and tawny with a black margin.

*Inhabits* Europe. B.

The Caterpillar is solitary and green, not spotted; it feeds on the *Aira montana*; the pupa is green, its case very thin. The Butterfly is much allied to the preceeding species; the anterior wings of the male are marked with a black line in the middle.

62. *Papilio Sylvanus*. Large Skipper B. Wings divaricated and brown, with square spots, which are yellow above, and whitish below.

*Inhabits* Europe. B.

63. *Papilio Thaumias*. Small Skipper. Wings divaricated and brown; with a tawny spot on the base, and a black line in the middle.

*Inhabits* North America. B.

Given on the authority of Lewin.

64. *Papilio Malvae*. Brown March B. Wings indented, divaricated, and brown, with waving cinereous lines;



## PAPILIO.

lines; transparent dots on the anterior wings; white dots on the under side of the posterior.

*Inhabits* Europe. B.

The Caterpillar feeds on the Mallow and Marsh Mallow; it is grey; the head black, with four sulphur coloured spots on the neck; it ties the leaves round it with a thread; the pupa is gibbous, and of a bluish colour.

65. *Papilio Fritillum*. Scarce spotted Skipper. Wings intire and divaricated, black, with white spots.

*Inhabits* Europe. B.

This is perhaps but a variety of the *Malva*.

66. *Papilio Tages*. Dingy Skipper. Wings denticulated, divaricated, and brown, with obsolete white dots.

*Inhabits* Europe. B.

Found in meadows. Like the *Malva*. Given on the authority of Lewin.

GEN. LXXI. SPHINX. Hawkmoth. Antennæ shaped somewhat like a prism, but attenuated at each end. The tongue in most species stretched out. Two reflexed palpi. Wings deflected.

Some of the species of this genus are the largest of lepidopterous insects. They fly, for the most part, early in the morning, and late in the evening, except the small species (the *Adscita*), which appear during the day. Their upper wings are longer and more narrow, and the under wings shorter than those of the Papilios. They hover about flowers, and without settling on them, suck the nectareous juices with their long spiral tongue. When they rest, they fold their antennæ under their breast, which, when they fly, are stretched out. Their Caterpillars are large, smooth, without hairs, and dotted; they have 16 feet, 9 spiracula on each side, with an erect, rigid, acute horn on the eleventh abdominal segment. They change into a pupa obtecta, either under leaves, or under the earth, where they make sometimes an ample web, and sometimes a firm case. The pupa is elongated; and generally continues through the winter before the perfect insect appears. Many of them fly with great rapidity, making a noise with their wings as they fly.

The

**SPHINX.**

The genus is divided into the following sections :

\* Antennæ as if scaly, palpi hairy, with a spiral tongue. *Legitimæ.*

a. the wings angulated.

b. the wings intire.

\*\* The wings intire ; the tail tufted ; tongue stretched out and truncated, the antennæ cylindrical. *Sesæ.*

\*\*\* Tongue exerted and setaceous. Antennæ thickest in the middle ; habit and larvæ various. *Adscitæ.*

\* *Legitimæ.*

a. With angulated wings.

1. *Sphinx ocellata*. Eyed Willow Hawkmoth. The posterior wings red, with a blue ocellus.

*Inhabits* Europe and America. B.

The Caterpillar is solitary, tailed, rough and green ; with white oblique lateral striæ, and yellow ocellated dots. It feeds on the Spirææ, Willow, and Fruit trees. The pupa is brown, black on the back. The perfect insect appears in May ; it has a ferruginous spot on the thorax ; its tongue is so very short as to appear wanting. The Caterpillar is found in August and September.

2. *Sphinx Populi*. Poplar H. Wings indented, reversed, and greyish ; the posterior ones ferruginous at the base, the anterior ones with a white dot.

*Inhabits* Europe. B.

The Caterpillar feeds on the Poplar and Willow ; it is solitary, tailed, rough, green, with an oblique white line on each side, and transverse striæ ; the pupa is dark grey, ferruginous behind. These, and many others of this genus should be bred from the Caterpillar, in order to have good specimens of the insect ; or they should be sought in May and June, near the trees on which they feed ; when they may be easily taken ; for if the insect breaks from the chrysalis in the morning, it never offers to fly till the evening.

3. *Sphinx Tilia*. Lime-tree H. Wings clouded with green and darker coloured fasciæ ; the under wings of a yellowish brick colour.

*Inhabits* Europe. B.

The

## SPHINX.

The Caterpillar feeds on the Lime-tree; it is solitary, rough, tailed, attenuated before and green, with oblique lateral stripe of a red or yellow colour. The pupa is dark brown.

## b. With intire wings.

4. *Sphinx Convolvuli*. Bindweed H. Wings clouded, the posterior ones somewhat fasciated, the abdomen with alternate bands of red, black and white.

*Inhabits* Europe. B.

Among the largest of the British species, but is not common. The Caterpillar feeds on the *Convolvulus* or Bindweed: it is tailed, with whitish oblique lines on each side, and spots resembling ocelli; it goes into the chrysalis state about the end of July, and the perfect insect appears next year from July to September. The pupa is brownish, with a reflexed curled horn.

5. *Sphinx Ligustri*. Privet H. The posterior wings red, with three black fasciæ; the abdomen red, with black bands.

*Inhabits* Europe. B.

The Caterpillar feeds on the Privet, the Lilac, the Ash, the Elder, and the Willow. To find it, look under those trees, for its dung, which, like that of many other Caterpillars, resembles the oblong section of a fluted column. The Caterpillar is tailed, and green, with oblique lateral stripe of a red colour before, whitish behind. When at rest it keeps the fore part of the body erect, with the feet elevated. It goes into the earth in August to change into chrysalis, and the Moth appears in June. The pupa is brown, with four dents at the tail.

6. *Sphinx Atropis*. Jasmine H. The posterior wings yellowish, with brown fasciæ, the abdomen yellowish, with black bands.

*Inhabits* Europe. B.

This is the largest of the British species; though in Egypt and India it is double the size; there is something like the figure of a death's head on the thorax; when taken it makes a noise by striking its palpi against the tongue. The caterpillar feeds on the Jasmine, the Potatoe and Hemp; it is solitary, retiring under ground during the day, and coming abroad

**SPHINX.**

abroad in the evening to feed ; it is tailed, and yellow, with black dots ; the transverse lateral lines are half blue, half green ; the tail is deflexed ; it goes into the chrysalis under ground in July, and the perfect insect appears in October. The pupa is brown, with five black stigmata on each side.

7. *Sphinx Celerio*. Silver-stripe H. Wings grey, with white striæ ; the posterior wings brown, with six red spots.

*Inhabits Europe.* B.

The Caterpillar is tailed, and brown, with two white lateral lines, and two ocelli on each side at the neck ; it feeds chiefly on the Vine ; the pupa is dark brown before, light brown behind. The insect is very rare in England.

8. *Sphinx Elpenor*. Elephant H. Wings variegated with green and purple ; the posterior wings red ; black at the base.

*Inhabits Europe.* B.

The Caterpillar is tailed, and spotted with brown ; with two blue ocelli on each side at the neck ; it feeds on the *Epilobium angustifolium*, on the *Impatiens*, *Convolvulus*, Vine, and Ladies Bed-straw ; it can protrude its head, and three first segments, to a tapering point, or draw them in so as entirely to conceal them. About the end of July it goes into the pupa state, where it remains till the following May.

9. *Sphinx Porcellus*. Small Elephant H. Wings variegated with yellow and purple ; the abdomen underneath blood-red, with white spots.

*Inhabits Europe.* B.

The Caterpillar has no horn on the tail ; it is brown, with three blue ocelli at the neck on each side. It feeds on the *Epilobium* and *Impatiens*. It makes a case, and changes to a blackish pupa in August or September, and the perfect insect appears in May of the following year.

10. *Sphinx Euphorbiae*. Spotted Elephant H. Wings grey, with two greenish fasciæ ; the posterior wings red ; the base and a streak black ; the antennæ white.

*Inhabits Europe.* B.

The Caterpillar is tailed, black, with white dots, a blood-red line along the back, and yellowish spots on the sides ; it feeds on plants of the *Euphorbia* genus ; the pupa is brownish.

## SPHINX.

brownish, with black stigmata. It is an exceedingly rare species in England.

11. *Sphinx lineata*. Wings olive, with a white fascia and striæ; the posterior wings black, with a red fascia.

*Inhabits* Europe. B.

This species is much allied to the *Celerio*, and is perhaps but a variety of it; if it be really a native in Britain, it is very rare. The Caterpillar feeds on the yellow Ladies Bed-straw, Madder, Goose-grass, &c. it is tailed, yellowish, and spotted with black; the head, the dorsal line, and the stigmata red.

12. *Sphinx pinastri*. Pine H. Wings hoary, the primary ones marked with three small black lines near one another; the abdomen brown with white bands.

*Inhabits* Europe.

The Caterpillar feeds on the Pine tribe; it has a tail, and is of a greenish colour, with a ferruginous line down the back, and a yellow line on the sides; the stigmata ferruginous, and somewhat like ocelli. The pupa is brown.

•• *Sefiae*.

13. *Sphinx Stellatarum*. Humming-bird H. The sides of the abdomen variegated with black and white; the posterior wings ferruginous.

*Inhabits* Europe. B.

The Caterpillar feeds on the stellated plants, such as the *Galium verum*, and *palustre*, *Rubia*, &c.; it is tailed, and dotted with white; the tail is subulated, and blue, the apex ferruginous; the pupa is brown. The insect is not common; it flies very swiftly, and by the motion of its wings produces a sound like that made by the bee or wasp. It flies rapidly from flower to flower, and without settling, inserts its long tongue into them to suck their nectareous juices. It remains during winter in the chrysalis state, and the fly appears in May.

14. *Sphinx fuciformis*. Clear-winged H. The abdomen black, with a yellowish fascia; the wings transparent, with a black margin.

*Inhabits* Europe. B.

The

## SPHINX.

The Caterpillar feeds on the wood of Willows; it is green, with a yellow lateral line and a red tail; the pupa is black, and inclosed in a case, with yellow streaks on the fore part. The fly is rare in England; it is found on the Honeyfuckle and Scabious.

15. *Sphinx apiformis*. Hornet H. Wings transparent; the abdomen yellow, with black incisures; the thorax black, with two yellow spots.

*Inhabits* Europe. B.

The Caterpillar is found in the trunk of the Poplar, at the depth of six or eight inches, feeding on the wood; where it likewise changes to a chrysalis; and by means of a double row of spines, with which it is furnished, makes its way out at the appointed time, and the fly then bursts the chrysalis and comes forth. It is found in Essex.

16. *Sphinx tipuliformis*. Currant H. Wings transparent, with a black margin and fascia; the abdomen black, the incisures yellow on the margin.

*Inhabits* Europe. B.

A small species found on the Currant; the Caterpillar lives in the wood; it is solitary, somewhat hairy and whitish; the head and feet are yellow, with a long line along the back of a darker colour.

17. *Sphinx zonata*. Red-bellied H. Wings transparent, veined, margined with a band, or streak of black. Abdomen black; with one segment in the middle, red.

*Inhabits* England.

Given from Donovan. Plate 195. It resembles the foregoing species; it is rare.

18. *Sphinx chrysothoea*. Golden tail H. Wings transparent, with black veins. Head, thorax, body, shining black; with yellow rings or belts; tail fine golden yellow.

*Inhabits* England.

Given from Donovan. Plate 116. It is rare in England; found in Kensington Gardens in June.

\*\*\* *Zygaenae*.

19. *Sphinx Filipendulae*. Burnet H. The primary wings

## SPHINX.

wings blue, with six red dots ; the hinder wings red, with a blue margin.

*Inhabits Europe.* B.

The Caterpillar is found on the *Spiræa Filipendula*, *Genista anglica*, and *Ulex europæus*. It is of a sulphur colour, with four lines of black dots. The pupa brown, yellow in the middle, with brown stigmata ; it is inclosed in a yellow case fixed to the stem of some plant. The perfect insect appears in June ; it flies heavily, and in the evenings sits in numbers together on grasses, when it is easily caught, as it does not offer to fly away. There are several varieties of it, particularly one with five spots.

20. *Sphinx Statices*. The Forrester. Of a yellowish green colour ; the hinder wings brown.

*Inhabits Europe.* B.

The Caterpillar is blackish, with two lines of white spots on the back ; its feeds on the *Globularia* and *Rumex acetosa*. The perfect insect appears in May and June. The colour of the body is somewhat darker than that of the wings, and shines like silk ; the farina of the wings falls off with the slightest touch.

GEN. LXXII. PHALÆNA. Moth. The antennæ gradually attenuated from the base to the apex ; the tongue spiral ; no maxillæ ; a short horny clypeus in most species.

The insects of this genus fly chiefly during the night. By day they lurk in concealed places ; but some species and even families of them fly in the day and in the evening. Even the caterpillars feed chiefly in the night. This is the most numerous genus of the whole insect tribe, there being, in Gmelin's edition of the *Systema Naturæ*, 1534 species described ; it has been divided into eight sections, according to the situation of the wings in the insect, or the form and changes of the Caterpillar. Of these sections Fabricius has made as many genera. The pupæ of all *Phalænas* are of an oval shape, and, except the *Alucitæ*, they spin a sort of web or form a case, thicker or thinner according to the species.

The divisions are as follows :

† With

**IALÆNA.**

† With filiform antennae.

**ATTACI.** With wings spreading horizontally; compressed palpi.

**BOMBYCES.** The wings not spreading horizontally; compressed palpi.

A. With reversed wings.

B. With deflexed wings.

a. With a short tongue.

a. The back smooth.

b. The back crested.

b. With a long tongue.

a. The back smooth.

b. The back crested.

C. With incumbent wings.

D. With convoluted wings.

**L. GEOMETRÆ.** With cylindrical palpi.

A. With angulated wings.

B. With intire wings.

C. With rounded wings.

**TORTRICES.** With nearly naked palpi, cylindrical at the base, dilated and ovate in the middle and subulated at the point.

**PYRALIDES.** With connivent wings.

†† With setaceous antennae.

**NOCTUÆ.** The tongue stretched out and horny.

A. With spreading wings.

B. With incumbent wings.

a. The thorax smooth.

b. The thorax crested.

C. With deflexed wings.

a. The thorax smooth.

b. The thorax crested.



## PHALÆNA.

VII. TINEÆ. The tongue stretched out and membranaceous.

A. With four unequal palpi.

B. With two palpi, bifid as far as the middle.

VIII. ALUCITÆ. With digitated wings.

+++ With short, moniliform antennæ.

## IX. HEPIALI.

The Phalænæ *Attaci* are, except one or two species, foreign insects; their antennæ are in general pectinated; their wings somewhat declining.

The caterpillars of the *Bombyces* have 16 feet, they are generally hairy and subcylindrical; the pupa is acuminate at the apex; the antennæ of the Moths are filiform, acute at the apex; of the male pectinated; of the female sometime setaceous; the palpi are two, compressed, reflexed, equal obtuse, with a short, spiral, membranaceous tongue, hardly stretched out, but rather hidden, filiform, obtuse and bifid.

The Caterpillars of the *Geometra*, have eight or ten feet; six on the three first segments; and two at the tail, and sometimes two on the segment next the tail; their motion in walking is somewhat like that of the Leech, or as if they were measuring or spanning the ground they traversed; while in a state of repose they stand nearly erect; they are smooth, and change sometimes above, sometimes under the earth. The pupa is acuminate at the apex. The Moths have filiform antennæ; the articulations not strongly marked; two equal palpi; reflexed, membranaceous, and cylindrical; the tongue stretched out, membranaceous, setaceous and bifid; the wings when the insect is at rest generally spread out horizontally; the females of some species want wings.

The *Tortrices* are small, with very obtuse wings, almost hollowed on the posterior margin; the exterior margin is curved; the antennæ filiform; the palpi two, equal; the tongue stretched out, membranaceous, setaceous, and bifid the Caterpillar has 16 feet; it folds and connects the leaves it feeds on into a habitation.

The inner margins of the wings of the *Pyrallides* are <sup>longer</sup> one over the other; the wings themselves decline a little towards the sides of the body, and in shape resemble a delta <sup>or</sup> triangle.

## PHALÆNA.

triangle. The antennæ are filiform, the articulations obsolete ; the palpi are two, equal, reflexed, membranaceous and cylindrical ; the tongue is stretched out, membranaceous, fetaceous and bifid ; the caterpillar has either 14 or 16 feet, and changes in a narrow web above ground.

The Caterpillar of the *Noctua* has 16 feet and is in general smooth ; and changes under the earth ; the pupa is acuminate at the apex ; the antennæ fetaceous, not pectinated ; the palpi two, compressed and hairy, cylindrical and naked at the points ; the tongue stretched out, horny, fetaceous and bifid.

The Caterpillars of the *Tinea*, have 16 feet, some 14 and others only 8 ; they are slender ; some live in society, others solitary ; some are uncovered, others lurk under a membranaceous case which they carry along with them. They feed sometimes on leaves, sometimes on fruits ; some on woollen clothes ; others reside within a leaf and eat only the pulpy part of it, without touching the double membrane ; these have got the name of *larvæ subcutaneæ* ; they all change above ground. The Moths are small, and when they rest, roll up the small leaves for protection. Some have four, others only two palpi.

The Caterpillars of the *Pterophori* or *Alucitæ* have 16 feet, they are thin, broad, hairy and move slowly. They change without weaving any web, like the *Papiios*, and the pupa is suspended by two threads. The antennæ of the moths are fetaceous, they have two very slender palpi, which are cylindrical, filiform, reflexed, naked, and subulated at the apex ; the tongue is stretched out, membranaceous, elongated, fetaceous and bifid.

The Caterpillars of the *Hepiali* have 16 feet ; they are nearly cylindrical, often smooth, and live on the roots of plants ; the pupa is inclosed in a case cylindrical, acuminate at the apex ; the fly has short moniliform antennæ, two equal palpi which are obtuse, compressed, membranaceous, and reflexed, with the rudiment of a bifid tongue between them.

† *With filiform antennæ.*

\* *Attaci.*

1. *Phalæna Atlas*. With falcated wings, of the same colour above and below, and variegated with yellowish

## PHALAENA.

lowish, a transparent spot on each wing, and on the primary wings a half ocellated spot.

*Inhabits* Asia and America.

One of the largest of the genus, the wings when expanded measuring from tip to tip upwards of eight inches; the Caterpillar feeds on the leaves of the orange, it is set with hairy orange-coloured warts, disposed in a verticillated form, and spins large cocoons of a strong silk, which however are not easily undone.

2. *Phalæna pavonia*. The Emperor Moth. With rounded wings, clouded with grey, and somewhat fasciated; in each a nictitating ocellus, with a transparent point.

*Inhabits* Europe. B.

This is the only species of the Attaci which is a native of Britain. The antennæ of the male are more pectinated than those of the female, and the base of his posterior wings is yellowish. The Caterpillars are gregarious, green, and verticillated, with hairy red and yellow warts, on a black band; the hairs setaceous. They are found on heath, the bramble, rose, elm, willow, and fruit-trees. About the middle of July, they spin a case of a very firm consistence, somewhat of the shape of a Florence flask without the neck; and having inclosed themselves in this case, they change into a blackish pupa, and thus remain till the month of April, when, the mouth of the case being elastic, yields to the efforts of the insect to get out, though constructed in such a manner as effectually to prevent any thing from entering. They sometimes remain in the pupa state near two years. The *pavonia* is one of the finest of the European Phalænæ.

\*\* *Bombyces*.

A. With reversed wings.

3. *Phalæna quercifolia*. The Lappet Moth. Wings indented, and of a ferruginous colour; the mouth and tibiae black.

*Inhabits* Europe. B.

This species has its latin trivial name from the resemblance it bears, when at rest, to a withered oak leaf. The Caterpillar is hairy, and of a ferruginous colour, with a projection like a tail; the segments at the neck are blue; it feeds on grasses, the sloe, the pear, and the willow; the pupa is brown with

**PHALAENA. BOMBYX.**

with red fasciæ ; they enter into this state about the end of May, and in a month the moth appears.

4. *Phalæna Rubi*. Fox coloured Moth. Wings of a yellow brown colour, with two whitish streaks that do not appear underneath.

*Inhabits* Europe. B.

The Caterpillar is hairy, black below, ferruginous above, with black rings ; when young, it is black like velvet, and the rings are light yellow ; it feeds on the bramble and the willow ; the pupa is blackish, with three yellow rings. The Moth appears in May ; the male flies swiftly, and comes abroad only in the evening.

5. *Phalæna potatoria*. The drinker Moth. Wings somewhat indented, and yellow, with a tawny-scolloped streak, and two white dots.

*Inhabits* Europe. B.

The Caterpillar feeds on grasses ; it has a tail and a crest ; it is hairy with white spots on the sides ; it proceeds from an egg, which is oblong, of a leaden colour, with a green ring, and a green point in the middle ; the pupa is blackish, inclosed in a strong yellowish case ; the Moth appears at the end of June. Goedart says it drinks much, and lifts its head, when it drinks, like a hen.

6. *Phalæna Cerasi*. Wings yellow, with two brown streaks, and a brown point in the middle ; and a point behind.

*Inhabits* England.

This species is found on the Cherry ; on the anterior wings the first streak is by far the largest ; between the two streaks there is a small brown point, and at the apex of the wings a white one.

7. *Phalæna Pini*. Pine Lappet Moth. Wings grey, with a ferruginous fascia, and a white triangular dot.

*Inhabits* Europe. B.

A rare insect in England. The Caterpillar feeds on the pine ; it has something of a tail, and is variegated with white, grey, and brown ; the segments at the neck are blue, with red dots on each side. The pupa is brown.

## PHALAENA. BOMBYX.

8. *Phalæna Quercus*. The great Egger moth. Wings ferruginous, with a yellow streak, and a white dot on the primary ones.

*Inhabits Europe.* B.

The Caterpillar feeds on the floc, the birch, the willow, and oak; it is hairy, grey, with black rings, and white spots; the pupa is inclosed in a large brown case; and the Moths appear in June, flying swiftly in the day-time, from noon to five o'clock. A female exposed at the sides of woods and green lanes, in a box, with a piece of crape over it to prevent its escape, will soon attract all the males that are near.

9. *Phalæna dumeti*. Wings brown; the anterior ones with a dot, a fascia and the posterior margin, yellowish.

*Inhabits Europe.* B.

The larva is brown with yellow dots and black transverse spots; it feeds on the lettuce and various other plants; the pupa is blackish; the tail dentated; it changes in the earth, and in October, and even sometimes later, the Moth appears.

10. *Phalæna lanestris*. The small Egger moth. Wings ferruginous, with a white streak; the primary ones with a dot, and the base, white.

*Inhabits Europe.* B.

The Caterpillars feed on the lime, the floc, and the willow; they are hairy and black, each segment having three white dots between two red spots, tufted like a pencil; they live gregariously under a web, with several divisions; they seldom leave the plant they are hatched on, till they have eaten it bare. Persons who breed them, must not separate them from the web, otherwise they will all perish. The pupa is sulphur-coloured; it is formed in July, and remains during the winter, and the Moth appears in April.

11. *Phalæna Vinula*. Puffs Moth. Wings somewhat reversed, veined, and striated with brown; body white with black spots.

*Inhabits Europe.* B.

The Caterpillar is solitary, gibbous, green, brown on the back, with two long setæ at the tail, which can be protruded or drawn in at pleasure; they are reddish when the larva is in its last skin but one, after which they shrivel up; it discharges an acrid fluid from a chink under the head; it feeds on willows, and poplars, and is found in July; in August it changes

**PHALAENA. BOMBYX.**

changes to a brown pupa within a hard case. This case is artificially formed of pieces of hard wood connected by threads of various figure, and appears at first sight to be the dung of some animal or bird, attached to the trunk of a tree. The Moth appears the May following; but sometimes not till the second year.

12. *Phalaena Fagi*. Wings reddish ash-colour; with two linear, yellowish, bent fasciae.

*Inhabits* Europe. B.

The Caterpillar is dark brown; the back dentated; the six anterior feet long; the tail reflexed, with two horns; when at rest, the head and tail are elevated, the anterior feet hanging down; it feeds on the beech, the birch and hazel. The pupa is blackish.

13. *Phalaena versicolor*. The glory of Kent. Wings grey, with black and white streaks; the thorax white on the anterior part.

*Inhabits* Europe. B.

This is a rare insect in England. The Caterpillar feeds on the Alder, the hornbeam, and the birch; it is green, with oblique lines of yellowish brown, and large spots of golden yellow; it changes under the earth, and lies the whole winter in a hard oval case made of silk and earth; the Moth appears in spring.

14. *Phalaena Mori*. The Silk-worm Moth. Wings pale, with three obsolete brown streaks, and a crescent-like spot.

*Inhabits* China and Persia.

The Silk-worm has been known in the Southern parts of Europe since the time of Justinian; but the use of silk was at all times known to the ancients, who, perhaps, procured it otherwise than from our insect, the cocoons of which, Pliny says, were first unwound and woven by one Pamphila, a woman of Coos, the daughter of Latous. The Moth endures a pretty northern climate. It deposits its eggs, which produce Caterpillars about the beginning of May, and must be fed with Mulberry leaves, though they will eat those of the lettuce. About the middle of June, having come to their full size, they spin the celebrated cocoon, which produces the silk, and though weighing only two grains and a half, consists of a thread 900 feet long. It requires two thousand silk-worms to make a pound of silk. In this cocoon the

## PHALAENA. BOMBYX.

Caterpillar changes to a pupa, and continues about twenty days, when the moth comes forth.

15. *Phalaena Populi*. December Moth. Brown, pale on the anterior part; wings brownish, with two whitish waved streaks.

*Inhabits Europe.* B.

The Caterpillar is hairy, of a cinereous colour, darker on the back; on each segment two pairs of reddish dots; it feeds on the poplar, and on fruit trees; the pupa is brown on the fore part, red behind; it changes in the earth about the middle of June, and the Moths appear in the beginning of winter.

16. *Phalæna Neustria*. Lacquey Moth. Wings grey, with two ferruginous streaks above, and one below.

*Inhabits Europe.* B.

The Caterpillars are gregarious, feeding on various plants, but particularly on fruit trees; they are somewhat hairy, and of a glaucous colour, with three red lines on the sides, and a white one down the back; the pupa is brown, enveloped in a double case; it is formed in July, and the Moths appear in August. They lay their eggs with the greatest symmetry in rings round a small branch; but the Caterpillars do not come forth till the ensuing spring.

17. *Phalæna castaneis*. Wings dark grey, with two pale fasciæ.

*Inhabits Europe.* B.

The Caterpillar feeds on the *Pilosella*, *Jacea*, *Achillea*, *Alchemilla*, *Euphorbia*, and other plants; it is gregarious, hairy, and bluish, with red lines and black spots. Several live together under a web, and often migrate to a new one. The pupa is dark coloured. The Moth, like the preceding species, lays its eggs close together in rings, round the branches of the plant. The wings have two fasciæ above, and a streak beneath.

18. *Phalæna processionea*. Wings of a cinereous brown colour; those of the female with a dark streak, of the male with three.

*Inhabits Europe.* B.

This insect is not common. The Caterpillar feeds on the Oak; it is gregarious, hairy, and of a cinereous brown colour,

**PHALAENA. BOMBYX.**

lour, blackish on the back, with yellow warts; the hairs when touched exciting inflammation. The Moth is of middle size. The thorax villous, cinereous and smooth; at the base of the wings is a brown shade.

B. With deflexed wings, *a. a.*

19. *Phalæna bucephala*. The buff-tip Moth. Wings cinereous, with two ferruginous streaks, and a large terminating yellow spot.

*Inhabits Europe. B.*

The Caterpillar is hairy and black: with yellowish rings and lines, and white dots upon the sides; it feeds on the Lime, the Alder, the Oak, the Willow, the Chestnut, and on fruit trees. About the end of August it goes into the earth and changes to a naked pupa, with two horns at the extremity. The Moth does not appear till the following May.

20. *Phalæna Caja*. The great tyger Moth. Wings brown, with irregular stripes of white; the posterior wings purple, with black dots.

*Inhabits Europe. B.*

The Caterpillar is solitary, hairy, and blackish brown, the segments, on both sides, with three elevated bluish dots; it feeds on the lettuce and other pot-herbs, and is very common in gardens, in the spring; when afraid it rolls itself up like a hedge-hog; the pupa is black and ovate, inclosed in a web, made of threads, which the caterpillar spins mixed with its own hairs, and attaches to leaves or stalks; in a month after this metamorphosis, that is, about the end of June or beginning of July, the Moth appears. It conceals itself under leaves during the day and is then very sluggish. The posterior wings are sometimes orange coloured.

21. *Phalæna villica*. Cream spot Tyger Moth. Wings black, with eight white spots; the under wings yellow, with black spots.

*Inhabits Europe. B.*

The Caterpillar is shaggy, blackish, with tawny spots; the head and feet red; it feeds on a variety of plants, such as the Elm, Nettle, Yarrow, Chick-weed, pot-herbs, &c. It lives all winter, and is to be found at the end of April; in the beginning of May it changes to a chrysalis within a web,  
and



**PHALAENA. BOMBYX.**

and in three weeks afterwards the Moth is bred, which flies in the day-time.

22. *Phalæna Plantaginis*. Wood Tyger Moth. Wings black, with white irregular stripes; the posterior wings yellow; the margin and spots black.

*Inhabits Europe.* B.

The Caterpillar is hairy and black; it lives all winter; it feeds on the Elm, the Plantain, Chick-weed, &c.; about the middle of April it spins a web, in which it changes to a chrysalis, and in the middle of May the Moth appears flying in the afternoon.

23. *Phalæna Monacha*. Black Arches Moth. Wings white, with black undulations; the segments of the abdomen of a blood-red colour.

*Inhabits Europe.* B.

The Caterpillar is of a cinereous brown colour, with red tufts upon the back, the second segment has a black heart-shaped spot; it feeds on the Bramble, Willow, Apple, Oak, Larch, and other pine trees; in the middle of June it spins a web, and changes to a chrysalis; in about a month afterwards the Moth is produced, which is not common.

24. *Phalæna dispar*. The Gypsy Moth. Wings of the male clouded with grey and brown; of the female whitish with black streaks.

*Inhabits Europe.* B.

The Caterpillar feeds on a variety of plants such as the Oak, the Lime, and fruit trees, and is a great calamity in orchards. It is hairy, with lines of white; on the anterior part bluish dots, on the posterior red; taken into the hand it excites itching. The pupa has four black dots on the anterior part, and is inclosed in a web; when touched, it writhes itself circularly. The Moth appears about the end of July, but is exceedingly rare in England. Wilkes says it was first bred from eggs sent to Mr Peter Collinson from Germany.

25. *Phalæna chrysothoea*. Yellow-tail Moth. Wings white; the body terminating in a ferruginous coloured tuft.

*Inhabits Europe.* B.

The Caterpillar is gregarious, hairy, and blackish; with two red lines on the back, and white tufts on the sides; it

**PHALAENA. BOMBYX.**

is polyphagous, feeding on the Elm, Oak, &c. and on fruit trees. At the beginning of June it spins a web, and turns to a blackish pupa; at the end of the same month the Moth comes forth; it rests upon the trunks of trees during the day and flies in the evening.

26. *Phalæna Salicis*. White satin Moth. Wings white; feet black, with white rings.

*Inhabits Europe. B.*

The Caterpillar feeds on the Willow, and the Poplar; it is black and hairy, with a white-line of spots down the back, and red dots. In June it changes to a hairy chrysalis within the leaves spun together, and lies in that state for twenty or thirty days, when the Moth flies abroad. It lays eggs, which remain a month before the Caterpillar breaks forth; and these live all the winter.

27. *Phalæna Cratægi*. Oak Egger Moth. Wings rounded and cinereous, with a fascia of a darker colour; the tail dentated.

*Inhabits Europe. B.*

The Caterpillar is black and hairy, with white fasciæ, and four ferruginous tubercles; it feeds on the white thorn; it changes to a chrysalis in June, and the fly comes forth in September. It is not common.

28. *Phalæna Coryli*. Nut-tree Tussock Moth. Wings bluish, with a ferruginous fascia and a black dot surrounded with a white ring; the thorax variegated.

*Inhabits Europe. B.*

The Caterpillar is red and hairy; with two tufts on the back, and one at the tail; those at the neck the longest; in September it spins a web, and remains there during the winter; the pupa is black before; behind brownish. It lives on the Hazle and Birch.

29. *Phalæna Furcula*. Kitten Moth. The thorax variegated; the wings grey, white at the base and at the apex, with black spots.

*Inhabits Europe. B.*

The Caterpillar is solitary, naked, green, and has two tails; it feeds on the black thorn, willow, &c. changes in August or September to a brownish pupa, inclosed in a case made of silk and bits of wood, and the Moth is bred in May  
or

## PHALAENA. BOMBYX.

or June ; the thorax is brown, spotted with yellow, the wings somewhat incumbent.

- 30 *Phalæna curtula*. Chocolate-tip Moth. Wings bluish, with white streaks, and a brown spot at the apex.

*Inhabits Europe.* B.

The Caterpillar is solitary, hairy, and ash-coloured, with four striæ of ferruginous spots ; it feeds on the Willow, the Oak, and the Poplar ; in October it makes a web, and changes into a brownish pupa, from which the Moth does not break forth till the end of July in the following year. The Moth is small in comparison of the Caterpillar.

31. *Phalæna Anastomosis*. Scarce Chocolate-tip Moth. Thorax rust-coloured ; wings grey, with three whitish streaks, a little branched.

*Inhabits Europe.* B.

The head of this species is inflected, and when it rests, its first pair of legs are stretched forwards. The Caterpillar is brown ; the back spotted with white, and a yellow line along the sides is dotted with red ; there is a protuberance on the shoulders, and another at the tail ; it feeds on the Willow ; the pupa is black with two red striæ. The Moth appears in August, after having remained in the chrysalis state about three weeks.

B. With deflexed wings, a. b.

32. *Phalæna pudibunda*. Pale Tussock Moth. Wings cinereous ; with three brown waved streaks.

*Inhabits Europe.* B.

The Caterpillar feeds on the Oak, Beech, Hazle, the different sorts of fruit trees, &c. ; it is yellow, and set with hairy tufts, the tuft upon the tail longer than the rest and red ; four brushes on the back yellowish white, the interstices of the rings black. In the end of September or beginning of October, it spins an oval case, in which it changes to a blackish brown pupa, and remains in that state till the May following, when the Moth appears.

33. *Phalæna fascelina*. Dark Tussock Moth. Wings cinereous, with numerous black points, and two waved orange streaks.

*Inhabits Europe.* B.

The

## PHALAENA. BOMBYX.

The Caterpillar feeds on the dandelion, trefoil, bramble, poplar, &c.; it is covered with tufts of hair and red dots; on the back are five white brushes, those at the head and tail brown. The pupa is blackish, with a hairy dorsal line. The Caterpillar lives through the winter, and about the middle of May spins a case of threads and its own hairs, in which it changes, and the Moth appears in June.

34. *Phalæna cæruleocephala*. Black thorn M. Wings grey, with two ferruginous fasciæ, and a whitish doubly divided spot.

*Inhabits* Europe. B.

The Caterpillar is smooth and bluish, with yellow longitudinal lines and black dots: towards the end of May it spins a hard case attached to fruit trees, on which it feeds, and changes to a brownish pupa; in six weeks after the Moth appears. This insect destroys the flower buds.

35. *Phalæna Ziczac*. The Pebble M. Wings with a dent on the interior margin, and a grey spot like an ocellus at the apex; the antennæ scaly.

*Inhabits* Europe. B.

This species has got the name of Ziczac from the singular attitudes of the Caterpillar, which often rests on two or four of its intermediate feet, with its head and anterior feet raised, and its tail erect. It is solitary and naked, with two prominences on its back, the tail red. At the end of June it draws together several leaves of the Willow, the tree it feeds on, and within these spins a very thin case of white silk, in which it changes to a reddish brown pupa, and in about three weeks the Moth comes forth.

36. *Phalæna Cossus*. Goat M. Wings clouded; with a black fascia across the hind part of the thorax; the antennæ lamellated.

*Inhabits* Europe. B.

The Caterpillar of this species feeds on the wood of the Willow; it is a little hairy, and of a carnation colour; the head black; it lives in this state three years before it is transformed to a pupa; when full fed it is four inches long: it makes a case composed of bits of wood and saw-dust, which it unites with a strong web, the inside lined with a fine white filmy substance like fattin: it remains in the pupa state two months, and at the end of June or in July the Moth is found. Ray and Linnæus suppose the Caterpillar to be the

## PHALAENA. BOMBYX.

Coffus of the Romans: but Pliny expressly calls the *Coffus* the worm of the oak, in which this caterpillar is never found; besides it exhales so very strong and disagreeable a smell, it is not probable it could ever have been used as food. See p. 63. No. 1.

37. *Phalaena trepida*. Swallow prominent M. A prominence on the back. Anterior wings pale in the middle; brown next the margin; streaked. A spot in the center of the wing.

*Inhabits* Europe. B.

Given from Donovan (Plate 139. fig. 1.) who is uncertain whether his insect is the *trepida* of the *Systema Naturæ*. The Caterpillar is supposed to live under the bark of willows, and the Moth is seldom found except among those trees.

38. *Phalæna purpurea*. The anterior wings yellow, with brown dots, the posterior red with black spots.

*Inhabits* Europe. B.

The Caterpillar is rough, grey, and spotted with white, smelling like Catmint. It feeds on the Currant: the pupa is naked and dark brown.

B. With deflexed wings. b. a.

39. *Phalæna aulica*. The anterior wings grey, with yellow dots; the posterior tawny with black spots.

*Inhabits* Europe. B.

The Caterpillar feeds on the Hounds-tongue, Angelica, Nettle, and grasses. It is black and solitary, with white warts, ferruginous below, above set with white hairs.

40. *Phalæna erminea*. Cream Ermine M. Wings white, with irregular black dots; on the abdomen five rows of black dots.

*Inhabits* Europe. B.

Given from Mr Marshall's Paper in the Linnæan Transactions (Vol. I.) who conceives that Linnæus has confounded this and the three following species under his *Phalæna lubricipeda* and *mendica*. The Cream Ermine Caterpillar feeds on fruit trees, on the nettle, the orchard, and the oak. It is brown, and hairy, with a yellowish dorsal line, and blue dots on the sides. In September it spins a case, in which it changes

**PHALAENA. BOMBYX.**

changes to a bluish pupa with red stigmata, and the Moth is bred in the May following. The tail is white, by which it is principally distinguished from the following. It is the *Membraſtri* of Donovan, plate 189.

41. *Phalæna lubricipeda*. Cream dot-stripe M. Wings yellowish with black dots, in general disposed in an oblique line across.

*Inhabits* Europe. B.

Linnæus seems to have considered these two species as different, though on the authority of De Geer he inserted them as varieties. The colour of the wings varies, being sometimes whitish, sometimes yellowish. The tail is occasionally of a brighter or deeper yellow, but never white. The Caterpillar changes to a pupa in September, and in June following the Moth appears.

42. *Phalæna mendica*. Spotted Muslin M. Wings of the male dark brown, of the female white and transparent; of both black spotted.

*Inhabits* Europe. B.

The Caterpillar feeds on a great variety of plants; it is hairy and greenish, with black dots in whorls, the head yellowish. The pupa is brownish; the Moth appears in May: the antennæ are black, the thighs yellowish.

43. *Phalæna papyratia*. Water Ermine M. Wings white, with black dots at the apex; on the abdomen five rows of black dots.

*Inhabits* Europe. B.

The Caterpillar of this species feeds on aquatic plants; it resembles that of the *mendica*, but is darker. The Moth resembles the *erminea*; but is more uncommon.

44. *Phalæna compressa*. Goose-egg M. Wings white, compressed and ascending, with a brown spot, continued across the anterior wings; a grey one in the middle, with a white lunar mark.

*Inhabits* Europe. B.

This is a small species of the section of Bombyx; the Caterpillar feeds on the black thorn, and is armed with four spines on the forepart, and two behind; the pupa is brown before, and blue behind: the Moth appears in June.

## PHALAENA. BOMBYX.

45. *Phalæna Ruffula*. Clouded Buff M. Wings yellow, with a blood-red margin, and brown lunulated spot, the hinder wings not spotted on the under side.

*Inhabits Europe.* B.

The Caterpillar feeds on grasses, lettuce and scabious; it is covered with thick hair, of a dirty orange colour, with yellow spots on the sides; it spins a web above ground in May, and changes to a reddish brown pupa: the Moth appears in June or July: the first joints of the legs are covered with a red wool.

46. *Phalæna grammica*. Wings yellow; the anterior with black striæ; the posterior with a black fascia on the hinder part.

*Inhabits Europe.* B.

The Caterpillar feeds on the ash and plantain; it is brown with a white longitudinal line on the back; and a yellow line on each side above the feet which are red. About the middle of Summer, it draws the leaves of the ash together and changes to a pupa, whence the Moth comes forth in October.

47. *Phalæna Parthenias*. Widow M. Wings brown; the primary ones with cinereous obscure fasciæ; the posterior with a red spot at the base, and a red fascia.

*Inhabits Europe.* B.

The Caterpillar feeds on the white Poplar; it is naked and green with red lines. The Moth is very rare, but has been taken in Hornsey wood in May.

48. *Phalæna camelina*. Dark prominent M. Wings denticulated and brown, with a dent on the interior margin of each.

*Inhabits Europe.* B.

The Caterpillar feeds on the Lime, Oak, Alder, and Birch. It is naked and greenish, with two horns at the tail, the stigmata purplish. About the end of October it goes into the earth, and changes to a pupa brown before and dark behind. In April or May of the following year the Moth appears.

B. V

. b. b.

49. *Phal*

ash.coloured  
with

**PHALÆNA. BOMBYX.**

with ferrugineous streaks, and marked with a double o.

*Inhabits Europe. B.*

The Caterpillar feeds on the Oak; it is naked, of a purplish colour, with white dots, and interrupted white lines on the back; in June it goes into the pupa state, spinning itself up in a leaf; and in July the Moth appears, which is a scarce insect.

50. *Phalaena Esculi*. Wood Leopard M. White, the wings with numerous bluish-black dots; six on the thorax.

*Inhabits Europe. B.*

The Caterpillar is yellow with black dots; the head and tail black; it feeds on the wood of the oak, the pear, and the horse-chestnut; it makes a case of the dust of the wood, which it gnaws and cements together. The Moth appears late in June; it is a very rare insect; the antennæ of the male are feathered in the middle or near the base, but terminate in a bristle like those of the female.

*C. With incumbent wings.*

51. *Phalaena antiqua*. White-spot Tussock M. The anterior wings ferruginous; with a white crescent at the posterior angle; the female apterous.

*Inhabits Europe. B.*

The Caterpillar is covered with tufts of hair; with four brushes on the back, white, two resembling antennæ, and one on the tail, dark. It feeds on the white thorn, plumb, lime, alder, and a variety of other trees. At the end of May it spins a case under the copings of pales or walls; the pupa is black and yellow; it remains fourteen days; and the Moth is bred in June and July.

52. *Phalaena Gonostigma*. Orange Tussock M. Wings brown, with two white spots opposite; the female apterous.

*Inhabits Europe. B.*

The Caterpillar is covered with tufts of hair; eight white brushes on the back; two upon the neck, and one on the tail blackish. It spins a case about the middle of May, and changes to a pupa, yellow before, and black behind. In eighteen



**PHALÆNA. BOMBYX.**

eighteen days the Moth appears. It is bred likewise in September; but it is very scarce.

53. *Phalaena graminis*. The Antler M. Wings greyish, with a trifurcated line and dots, whitish.

*Inhabits Europe.* B.

The larva feeds on a variety of grasses; but is not found on the Alopecurus; it is sometimes so numerous in Sweden, as to lay waste the meadows, and endanger the lives of the cattle for want of food; it is smooth, dark coloured, with yellow strizæ along the sides and the back; it is eaten by swine and by crows; it remains fourteen days in the pupa state.

54. *Phalaena rosea*. Wings rose coloured, with three brownish streaks; of which the middle one is wavy, and the third is made up of dots.

*Inhabits Europe.* B.

The Caterpillar is short and very rough; the hair grey; feathery and in tufts; orange coloured at the mouth; it is found on the lichens of trees. The case of the pupa is thick, and interwoven with hairs.

55. *Phalaena Libatrix*. Furbelow M. Wings deeply and irregularly indented, of a reddish grey colour, with a white dot.

*Inhabits Europe.* B.

The Caterpillar is naked and green with yellow rings, with three brown longitudinal lines and red stigmata. It feeds on the ground ivy, the rose, and the willow, and is found under the bark of the last. In the beginning of August it changes to a black pupa, and in sixteen days the Moth appears.

56. *Phalaena Dominula*. Scarlet Tyger M. Wings black and silky, with yellowish white spots; the hinder wings red, spotted with black.

*Inhabits Europe.* B.

The Caterpillar feeds on the Hounds-tongue, Nettle, White Archangel, &c.; it is solitary, hairy, black, with three yellow longitudinal lines, and white spots. In May it makes a web among the dead leaves on the ground, and changes to a brown pupa. In June the Moth appears, and flies in the day-time.

53. *Phalæna*

PHALÆNA. BOMBYX.

57. *Phalaena fuliginosa*. Ruby Tiger M. Wings reddish brown, with two black dots; the abdomen blood-red; the back blackish.

*Inhabits* Europe. B.

The Caterpillar feeds on the *Cynoglossum omphalodes*, the dock, rape, mustard, grass, groundsel, &c. and on the birch and alder; it is hairy, of a ferruginous colour; the head and foremost feet black; in winter found in great numbers on the snow in Norway, presaging a cold summer and bad harvest. In June, or earlier, it spins a case, and changes to a black pupa, with a yellow fascia behind; in fourteen days the Moth appears; the hinder wings are bordered with crimson.

58. *Phalaena Jacobææ*. Cinnabar M. Wings brown, with a red line, and two red dots; the under wings red with black margins.

*Inhabits* Europe. B.

The Caterpillar is somewhat hairy, and black with yellow rings; it feeds on the ragwort. In July it spins a very thin case, in which it changes to a brick-coloured pupa, and remains in that state till May of the year following.

59. *Phalaena rubricollis*. Red-neck M. Black; the neck of a blood-red colour; the abdomen yellow.

*Inhabits* Europe. B.

The Caterpillar is hairy and blackish, with black fasciæ; the head black, with a white triangular spot. It feeds on the Lichen olivaceus of the Pine and the Beech. The Moth is found in June; it flies among the tops of oak trees.

\*\*\* *Geometra*.

A. With angulated wings.

60. *Phalaena nivearia*. Wings white; the posterior margin and under side of the anterior wings brown; a black spot in the centre of the posterior wings.

*Inhabits* Europe. B.

The antennæ are pectinated; it is found in woods.

61. *Phalaena vernaria*. Green House-wife Moth. Wings greenish, with two white weaved streaks; antennæ setaceous at the apex.

*Inhabits* Europe. B.

The

## PHALÆNA. GEOMETRA.

The Caterpillar feeds on the Jasmine, Honeyfuckle, and Lilac ; it is of a ferruginous colour, variegated with black and white ; the head dentated.

62. *Phalaena putataria*. Wings white, with two bright white waved streaks ; the antennæ setaceous at the apex.

*Inhabits Europe.* B.

Found in woods. The colour of the wings is like mother of pearl ; there is no dot in the centre.

63. *Phalaena punctaria*. Wings cinereous, with a ferruginous streak and a transverse row of black dots.

*Inhabits Europe.* B.

The Caterpillar feeds on the oak ; it is cinereous, marked on the sides with yellow and red spots ; the pupa is attached to a leaf ; it is reddish above ; yellowish below.

64. *Phalaena amataria*. Buff Argus M. Wings pale and powdery ; with a straight purple fascia, and a brown waved streak.

*Inhabits Europe.* B.

The Caterpillars feed on the oak ; they are green with rings ; yellow above and red below. When they change into a chrysalis, they tie themselves up in the manner of the Cabbage Butterfly, and in a month afterwards the Moth appears.

65. *Phalaena sambucaria*. Swallow tail M. Wings yellowish, and angulated with a tail ; two dark streaks across ; the posterior wings with two black dots at the apex.

*Inhabits Europe.* B.

The Caterpillar lives on the Elder ; it is somewhat knobbed ; of a ruflet colour with brown lines ; in April or May, it changes to an elongated brown pupa, with darker dots. The Moth is bred in June ; it lays eggs that are ribbed.

66. *Phalaena lacertinaria*. Wild Rose M. Wings deeply and irregularly indented, yellowish, of a deeper colour behind, with two streaks across and a dot, brown.

*Inhabits Europe.* B.

The Caterpillar feeds on the oak and birch ; it is naked,  
red,

## PHALAENA. GEOMETRA.

red, angulated on the back, with the tail sharp at the point. the pupa is conical, and brown with white points.

67. *Phalaena alniaria*. Wings deeply indented, yellow, sprinkled with brown; two brown streaks.

*Inhabits* Europe. B.

The Caterpillar feeds on the Alder, and on fruit-trees; it is of a greyish brown colour, dotted with yellow; on the back are three distant protuberances; on the tail four close ones; the pupa is bluish, attenuated backwards. The Moth appears in August and September.

68. *Phalaena fyringaria*. Richmond Beauty. Wings somewhat irregularly indented, of a yellowish grey colour, with waved brown and white streaks.

*Inhabits* Europe. B.

The Caterpillar feeds on the Lilac; it is partly of a black, and partly of a brown colour; on the back it has six prickles, those on the hinder part longest and recurved. The pupa is thick and short, grey before, brown behind; and is found among the leaves; it changes in May, and continues fourteen days, when the Moth appears. (Pl. VII. fig. 9, 10, 11.)

69. *Phalaena lunaria*. Beautiful thorn M. Wings angulated and indented; red at the base, with a white linear spot; cinereous behind.

*Inhabits* Europe. B.

The Caterpillar feeds on the Pear, Willow, Lime, and Birch; it is grey, with divided tubercles on the back, and whitish fasciæ, spotted with black below; it spins a reddish web on the leaves, and changes to a dark brown pupa. The Moth appears in June.

70. *Phalaena dentaria*. Wings angulated and dentated, above pale, with ferruginous streaks; below ferruginous, with an obscure lunar spot.

*Inhabits* England.

The wings have three streaks, and the margin is also ferruginous with white points

71. *Phalaena dolabraria*. Wings yellow, with ferruginous streaks, and the posterior angle purple.

*Inhabits* England and Germany.

Found on the oak.

## PHALAENA. GEOMETRA.

72. *Phalaena prunaria*. Orange M. Wings somewhat indented, yellowish, sprinkled with brown; on the anterior wings a brown semi lunar spot.

*Inhabits* Europe. B.

The Caterpillar feeds on the black thorn, bramble, &c.; it is of a ferruginous colour, with two spines on the anterior and posterior part. In May and June it encloses itself in a web, and changes to a pupa, from which, in about three weeks, the Moth breaks forth. The wings of the female are yellow, and the spot wanting.

73. *Phalaena ustularia*. Early thorn M. Wings indented, light brown, varied with shades of a scorched colour; three waves of dark brown across each superior wing, with a spot of orange, or bright brown, at the base, and another nearly of the same colour at the exterior margin of each.

*Inhabits* England.

Given from Donovan, Plate 2. The Caterpillar feeds on the oak; it is greenish above, ferruginous below; in August it changes to a black pupa, in which state it continues through the winter. In March the Moth appears; it varies much in colour, and is not very common.

74. *Phalaena suberaria*. Waved umber M. Antennæ yellowish; a dark ferruginous dash across the superior wings, and a band of the same on the inferior pair; the whole of the upper surface streaked with numerous irregular transverse lines.

*Inhabits* England.

Found on the oak in May. See Donovan, Plate 251.

75. *Phalaena falcata*. Wings falcated and orange coloured, with two brown dots between yellow streaks.

*Inhabits* England and Austria.

The streaks on the wings are waved, and the dots contiguous; towards the apex of the wing a brown mark; the posterior wings of a lighter colour. The whole yellow below, without any spot.

76. *Phalaena dimidiata*. Wings indented, yellow before.

## PHALAENA. GEOMETRA.

fore, brown grey and black. The nerves of the wings dotted with black.

*Inhabits* England.

See Donovan, Plate 246. fig. 2.

77. *Phalaena viridata*. Small green House-wife M. All the wings green, with a pale streak.

*Inhabits* Europe. B.

The Caterpillar is of a carnation colour, yellow or green, with a darker line along the back, and two denticuli on the head and neck: it feeds on the oak and thorn: in May it spins itself up, and changes to a pupa, which remains in that state till about the middle of June.

78. *Phalaena lucidata*. Dartford Emerald M. Fine lucid green; two white waves across the upper, and one across the under wings.

*Inhabits* England.

Given from Donovan, plate 97. It is not a variety of the foregoing species, as the Caterpillars resemble each other.

79. *Phalaena dubitata*. Tissue M. Wings waved with brown behind.

*Inhabits* England.

The wings are rounded, with minute brown points, a dot and two streaks.

B. *With intire wings.*

80. *Phalaena pennaria*. Wings reddish, with two brown streaks, and a black dot near the apex; a white one in the centre.

*Inhabits* Europe. B.

81. *Phalaena piniaria*. Wings brown, with yellow spots; clouded underneath, with two brown fasciæ.

*Inhabits* Europe. B.

The Caterpillar feeds on the Pine, the Lime, the Birch, &c.; it is green, with white striz above, and yellow below; the pupa is brown; the antennæ of the male Moth are finely pectinated; in those found in the neighbourhood of Edinburgh, the spots on the wings are white.

82. *Phalaena limbaria*. The frosted yellow M. Wings ferruginous, the border black; the under

## PHALAENA. GEOMETRA.

side of the posterior wings black, with white striz.

*Inhabits* England.

The under side of the anterior wings is ferruginous, powdered with brown; the upper side of the posterior wings ferruginous, with minute brown dots, and brown margin. There are two broods in a year; one in May, the other in August.

83. *Phalaena papilionaria*. Green Broom M. Wings green, somewhat scolloped on the edges; with a waved streak, and another whitish.

*Inhabits* Europe. B.

The Caterpillar feeds on the lime and birch; it is green, with ten red incurved prickles on the back. About the end of May or beginning of June, it draws round it some small leaves with a thread, and changes to a green pupa, variegated with yellow. In fourteen days afterwards the Moth appears.

84. *Phalaena porata*. Wings pale, powdered with red; in each a white ocellated dot.

*Inhabits* Europe. B.

The Caterpillar is green with small lateral lines and red dots. The posterior margin of the wings is dotted with black; on the under side the colour is paler, and there are no spots.

85. *Phalaena repandata*. Wings cinereous, waved with brown; the margin of the posterior wings scolloped and edged with a black line.

*Inhabits* Europe. B.

The Caterpillar is not known. The Moth is found in June.

86. *Phalaena cuspidata*. Wings yellow; with a brown dentated fascia, and a black line in the apex.

*Inhabits* Europe. B.

Found in the neighbourhood of Edinburgh; the Caterpillar unknown. On the anterior wings at the base, there is an obsolete brown curved fascia, in the middle a broad brown fascia, crenated before, dentated behind, with one dent larger than the rest; at the apex an oblique brown line. The posterior wings are pale yellow, without any spots.

## PHALÆNA. GEOMETRA.

87. *Phalaena oblongata*. Wings white, with a brown spot inclosing a black dot.

*Inhabits* Europe. B.

The primary wings have three small black dots near the base of the exterior margin; in the middle, a pretty large brown spot, inclosing on the fore-part, a black lunated dot; behind this a brown curved fascia, and another waved within the margin. The margin is white with seven brown dots. The posterior wings have a small dot in the middle, and two waved brown fasciæ within the margin spotted with black.

C. *With rounded wings.*

88. *Phalaena vibicaria*. Wings yellowish; with three purple streaks; the first the most obscure.

*Inhabits* Europe. B.

Found in woods; in each wing there is a purple transverse dot, a purplish fascia, on the fore-side of which the colour is deepest; a streak, and the whole margin purplish, as are all the wings on the under side.

89. *Phalaena atomaria*. Dark Heath M. All the wings yellowish, with brown streaks and specks.

*Inhabits* Europe. B.

The Caterpillar lives on the *Centaurea scabiosa*, and the *Lathyrus pratensis*; it is smooth and grey; with numerous ferruginous interrupted lines, and two tubercles behind. The perfect insect is common on heaths and barren places in May.

90. *Phalaena betularia*. Spotted Elm M. All the wings white, sprinkled with numerous black points; a black fascia on the thorax; the antennæ setaceous at the apex.

*Inhabits* Europe. B.

The Caterpillar lives on the birch, the willow, the rose, &c. it is of a dark colour with tubercles, and the head as if cleft; it goes into the earth in August or September, and changes to a naked brown pupa, from which, in the following May, the Moth breaks forth.

91. *Phalaena prodromaria*. Oak-beauty M. Wings white dotted with black; with two broad brown fasciæ.

*Inhabits* Europe. B.

The



## PHALÆNA GEOMETRA.

The Caterpillar feeds on the oak and the lime; it varies in colour, being cinereous, ferruginous, or brown with a grey head: it goes into the earth to become a pupa, which is brown, and the Moth appears in March and April; it is not common.

92. *Phalaena pantaria*. Wings white, with a yellowish fascia made up of spots; the abdomen yellowish with black dots.

*Inhabits* England and Portugal.

The Caterpillar feeds on the elm, the plane, &c. it is green with black lines; the head and tail black; the pupa bluish. The Moth is found in June, hitherto only in Yorkshire. It is the *ulmæta* of Fabricius.

93. *Phalaena Wavaria*. Gooseberry M. Wings cinereous; the upper ones with four abbreviated, unequal, black fasciæ.

*Inhabits* Europe. B.

The Caterpillar feeds on the currant and gooseberry; it is somewhat hairy, green, and dotted with black, having a yellow line along the back, and two on the sides. About the middle of May, it goes into the ground to change into a naked, brown, pointed pupa. About the middle of June the Moth appears, which is very common.

94. *Phalaena ditaria*. Maid of honour M. Wings green; with brown spots on the margins.

*Inhabits* Europe. B.

The Caterpillar feeds on the oak; it is grey, and covered with small leaves and scales; the Moth is found in June, but is not common.

95. *Phalæna viridaria*. Wings green, streaked with white, and black spots on the margins.

*Inhabits* England.

The wings are cinereous underneath; the hinder ones streaked with brown.

96. *Phalæna plumbaria*. Wings of a leaden colour, with three streaks and a central dot brown.

*Inhabits* England.

Found in woods; the anterior wings have a small waved streak at the base, and two in the middle straight and brown; between the posterior streaks, is a small brown dot; the posterior

## PHALAENA. GEOMETRA.

terior wings are like the others, cinereous underneath, and without any spots. It is found in June.

97. *Phalaena purpuraria*. Wings yellowish; the margin and two fasciæ on the primary wings purple.

*Inhabits* Europe. B.

The Caterpillar feeds on the oak and black thorn; it is green; the back brown, with a pale line; the Moth is among the smallest of this section.

98. *Phalaena pufaria*. Wings white, with three brown obsolete streaks.

*Inhabits* Europe. B.

The Caterpillar feeds on the birch and alder; it is yellowish, with red lines and spots on the back.

99. *Phalaena defoliaria*. Wings grey, with minute brown points, and white in the middle, with a brown dot; the female apterous dotted with black.

*Inhabits* Europe. B.

The Caterpillar feeds on fruit-trees, the lime, &c.; it is of a ferruginous colour, with a sulphureous streak on the sides. The Moths abound in some places and seasons to an astonishing degree. In the 32d Volume of the Swedish Transactions, is an account of the taking of these Moths by means of stripes of bark tied round near 600 fruit-trees, and covered with tar, which was afterwards constantly kept moist. From the 23d September, to 6th November, no less than 22716 females were taken, besides 6000 that were not counted, and males in proportion. Supposing then, that each female had laid 250 eggs, there would have been at least seven millions of Caterpillars produced by the Moths in that place.

100. *Phalaena vespertaria*. Wings yellowish, with two streaks, the posterior one separating the border, which is of a darker colour.

*Inhabits* England.

On the upper wing there is a curved streak or fascia, making a segment of a circle with a purple margin; in the middle of the wing is a purplish dot. All the wings below and the posterior above, have a small dot in the middle, and a purple margin.

101. *Phalaena chaerophyllata*. Great chimney sweeper.  
Black,

## PHALAENA. GEOMETRA.

Black, the wings erect, the primary ones white at the tips.

*Inhabits* Europe. B.

The larva is smooth and green; it feeds on the *Chaerophyllum sylvestre*. The Moth appears late in July; when at rest it keeps its wings erect like a *Papilio*.

102. *Phalaena clathrata* Pale Heath M. All the wings yellowish; with black cross lines.

*Inhabits* Europe. B.

This is a rare insect, except in Kent, where it is found in June on heaths, chalk-pits, and other barren places.

103. *Phalaena undulata*. The Scallop shell. All the wings on the upper side thickly crossed with brown waved streaks:

*Inhabits* Europe. B.

The wings have a light brown border, along the middle of which runs a white serpentine line. The male has two tufts of black hair, one on each side of the abdomen. It is found about the middle of June, near wood sides, but is not common. The Caterpillar feeds on the *Salix caprea*.

104. *Phalæna grossulariata*. Large Magpie M. Wings whitish, with black rounded spots, and yellow streaks on the primary ones.

*Inhabits* Europe. B.

The Caterpillar is well known; it feeds chiefly on the Gooseberry and Currant, but, early in the Spring especially, likewise eats the leaves of the Peach and other fruit-trees. It is somewhat hairy, cinereous above with black spots, yellow below; it lives over the winter concealed in the chinks of bushes and fruit walls, and about the end of May it spins a thin web in which it is transformed into a black pupa with yellow fasciæ; the Moth appears about the end of June and beginning of July. Fabricius says, the egg remains for six or eight months after it is deposited, before the Caterpillar comes forth.

105. *Phalæna crataegata*. Brimstone M. Wings bright yellow; on the primary wings three ferruginous spots along the anterior margin, somewhat silvery in the middle.

*Inhabits* Europe. B.

The

## PHALAENA. GOMETRA.

The Caterpillar is grey, with a divided tubercle on the back; it feeds on the white thorn, and is full fed about the middle of September, when it changes to a brown pupa within a cinereous case, with rusty spots, in which state it continues till April or May of the following year, when the Moth comes forth; it is very common in the evenings about thorn hedges.

106. *Phalæna bilineata*. Wings yellow, waved with brown; on the upper side of the primary wings a waved fascia; the margin brown and white.

*Inhabits* Europe. B.

Found on the *Lychnis dioica*; the Caterpillar is greenish, hardly spotted; sometimes with an appearance of white lines.

107. *Phalæna chenopodiata*. The primary wings of a testaceous colour; with three grey fasciæ; a black dot between the two hinder fasciæ, and a line at the apex brown above.

*Inhabits* Europe. B.

The Caterpillar feeds on the Orach; it is naked and greenish, or marked with brown lines; with angulated segments. The pupa is yellowish.

108. *Phalæna hexapterata*. Seraphim M. Wings varied with brown and grey; the posterior ones white, with a bastard wing at the base of each.

*Inhabits* Europe. B.

This insect is remarkable for the appendage at the base of the posterior wings; it is peculiar to the male which appears at first sight to have six wings. It has been found on Epping forest. The Caterpillar feeds on the Beech.

109. *Phalæna comitata*. Primary wings yellowish; with three grey fasciæ, a brown dot, and at the apex a brown line.

*Inhabits* Europe. B.

The Caterpillar is green, variegated with ferruginous colour, the head pale, with two brown lines. The Moth is found in July in woods.

110. *Phalæna plagiata*. Wings grey, with two brown three-lined fasciæ.

*Inhabits* Europe. B.

The Caterpillar feeds on the *Hypericum*; it is brown, Vol. II, Y variegated

**PHALAENA. GEOMETRA.**

variegated with a ferruginous colour; on the sides a yellowish line. The posterior wings of the Moth are cinereous as the whole wings are on the under side, with a black central dot.

111. *Phalæna rufata*. Wings cinereous, on the hinder part ferruginous, with a white streak and black dots on the margin.

*Inhabits* England and Germany.

The base of the wings is marked with two or three small red spots; the white streak hardly reaches the outer margin.

112. *Phalæna prunata*. Wings grey; the primary ones with two pale waved fasciæ; the hinder fascia terminating the wing.

*Inhabits* Europe. B.

The Caterpillar feeds on the plumb and the currant; it is of a cinereous colour with red spots on the back, and the feet red; the segment at the neck black.

113. *Phalæna alchemillata*. Wings brownish; the primary ones waved with a white waved fascia, and a small white line within the apex.

*Inhabits* Europe. B.

The Caterpillar feeds on the *Alchemilla vulgaris*; it is smooth and green, with yellow fasciæ, and a white line along the sides. The Moth is small, and appears in June.

114. *Phalæna hastata*. Argent and Sable M. Wings black, with white spots; two dentated white fasciæ with black dots.

*Inhabits* Europe. B.

The Caterpillar feeds on the birch, white-thorn, and alder; it is of a dark brown colour, with yellow waved spots along the sides. The pupa is brown; it remains in this state about a month, and in June the Moth appears.

115. *Phalæna albicillata*. Clifden Beauty. All the wings blackish, with a broad white unspotted fascia.

*Inhabits* Europe. B.

The Caterpillar is green, on most of the segments a lateral line, the intermediate ones brown, with a small crescent-like spot on the back; it feeds on the Rasp. The pupa is naked and brown. The Moth is very rare; it is found in June,

116. *Phalæna*

## PHALAENA. GEOMETRA.

116. *Phalaena marginata*. Wings white, the border at the exterior margin brown and interrupted.

*Inhabits* Europe. B.

The Caterpillar is found in May; it lives on the Hazel.

117. *Phalaena lynceata*. Wings white; with two fasciæ and a dot at the apex, brown.

*Inhabits* England.

The abdomen is white, with brown dots on the back, the posterior wings are white with a brown dot.

118. *Phalaena fluctuata*. Wings cinereous, the primary ones with three brown abbreviated fasciæ.

*Inhabits* Europe. B.

The Caterpillar feeds on fruit-trees, particularly the Plum; it is of a yellowish green colour with red dots. About the end of July it changes, and the Moth appears in August.

119. *Phalaena immutata*. Wings white, with dark waved streaks; the posterior margin black spotted.

*Inhabits* England.

There is a dot in the centre of all the wings; but that on the anterior is the smallest; underneath, the wings are of a much darker colour, with a single fascia, placed on the hinder part.

120. *Phalaena maculata*. Wings yellow with black spots.

*Inhabits* England.

The base of the wings is thickly set with brown dots. It is found on heaths, and is extremely common about the hedges near London in the months of June and July.

121. *Phalaena euphorbiata*. Smallest Quaker M. Wings brownish grey, without spots.

*Inhabits* Europe. B.

The Caterpillar feeds on the Euphorbia. The Moth is found in May.

122. *Phalaena punctata*. Wings white, the primary ones with a brown dot in the middle, and the margin black spotted.

*Inhabits* England.

The body and posterior wings are white without spots.

123. *Phalaena sociata*. Wings bright yellow, with a broad

## PHALÆNA. TORTRIX.

132. *Phalaena fagana*. Common Silver-line M. Wings green; with three white oblique streaks, the antennae and feet orange.

*Inhabits* Europe. B.

This resembles the foregoing, but the margin of the wings is sometimes of a blood-red colour. The Caterpillar feeds on the Beech; it forms to itself a dark brown case on the back of a leaf, and changes to a pupa in September; the Moth appears in the May following.

133. *Phalaena viridana*. Small green Oak M. Wings of a rhomboid shape, the primary ones green, and not spotted.

*Inhabits* Europe. B.

The Caterpillar is naked, green, with black dots: the hinder feet yellow; it feeds spun up in the leaves of the Oak. About the beginning of June it changes to a brown pupa, with a bifid stylus at the hinder part, within the oak leaves wrapped up and fastened by a web, and after remaining so for fourteen days, the Moth appears.

134. *Phalæna clorana*. Wings of a rhomboid shape; the primary ones green, with a white margin.

*Inhabits* Europe. B.

The Caterpillar is greenish, with white dots, and brown spots on the sides: it feeds on the Willow.

135. *Phalæna emargana*. Notch-wing M. Wings with the appearance of a tail, yellow, reticulated with brown, and a broad brown fascia; the anterior margin deeply excavated.

*Inhabits* England.

The apex of the wing forms an obtuse dent like a tail; the interior margin orange, the exterior excavated.

136. *Phalæna caudana*. Wings grey, with the appearance of a tail; the interior margin orange, the exterior excavated.

*Inhabits* England.

Much resembles the preceeding; but the wings are grey.

137. *Phalæna scabrana*. Primary wings cinereous, with brown fasciæ; the exterior margin excavated behind.

*Inhabits* England.

The

**ALÆNA. TORTRIX.**

The wings are rough with raised dots. In size and habit it resembles the preceeding.

8. *Phalæna quercana*. Primary wings yellow; with two sulphur coloured spots on the margin between the base and the apex.

*Inhabits* Europe. B.

The antennæ are white; the head and thorax cinereous.

9. *Phalæna ocellana*. Wings cinereous; a red spot in the middle, and a white dot.

*Inhabits* England.

The body is cinereous; on the anterior wings an oblong red coloured spot, in which is a white dot; the posterior margin dotted with black; the posterior wings white.

10. *Phalæna Zoegana*. Wings yellow, with a ferruginous dot in the middle; ferruginous behind, with a yellow spot.

*Inhabits* Europe. B.

A rare insect in England; taken on Epping forest in June.

11. *Phalæna bamana*. Primary wings yellow, with a dot and a ferruginous hooked spot behind.

*Inhabits* Europe. B.

This is perhaps but a variety of the preceeding species.

12. *Phalæna obliquana*. Wings cinereous, with oblique orange fasciæ, and white spots.

*Inhabits* England.

The head and thorax are ferruginous; on the anterior wings are three oblique tawny fasciæ, the whole margin white.

13. *Phalæna cporana*. The Plumb-tree M. Primary wings ferruginous, spotted, and reticulated with brown.

*Inhabits* Europe. B.

The Caterpillar feeds on fruit-trees; it is green and somewhat hairy, with a brown head: it changes to a chrysalis about the end of May, within leaves spun together, and lies in that state till the middle of June, when the Moth appears.

14. *Phalæna ilicana*. Primary wings greyish-brown, with brown dots, and a single black one in the centre.

*Inhabits* England.



## PHALÆNA. TORTRIX.

A large species of this section: the anterior wings are broad, before the middle are two close brown dots; after that, the black one in the centre. At the posterior margin are two or three close brown dots, and upon the margin itself a streak of brown dots. Posterior wings cinereous.

145. *Phalæna rosana*. The primary wings testaceous, with a grey oblique fascia.

*Inhabits* Europe. B.

The Caterpillar feeds on the Rose and the Barberry. The colour of the Moth is grey; but on the upper side of the primary wings there are obscure transverse unequal lines, and their posterior margin is notched. About the middle of July it draws together the two edges of a Barberry leaf, in which it changes to a blackish pupa, and in ten days the Moth comes forth.

146. *Phalæna Smeathmanniana*. Wings whitish, with two oblique brown fasciæ; the anterior one abbreviated, the other interrupted.

*Inhabits* England.

The anterior fascia does not reach the margin, the other is interrupted in the middle. The posterior wings are darker than the anterior.

147. *Phalæna avellana*. Primary wings testaceous, with two brown oblique fasciæ, and a third interrupted.

*Inhabits* Europe. B.

The wings are somewhat deflexed, short, and broad; the primary wings have two brownish grey fasciæ, pointing backwards; the posterior one interrupted in the middle.

148. *Phalæna Heperana*. Primary wings of a dark cinereous colour; with a fascia in the middle, and a spot on the apex, brown.

*Inhabits* England.

In size and figure it resembles the *avellana*; the anterior wings are sprinkled with many brown points; the posterior ones cinereous.

149. *Phalæna Christierna*. Primary wings bright yellow, with reticulated blood-coloured veins.

*Inhabits* England and Sweden.

The head, thorax, and primary wings yellow, marked with broad anastomosing lines of a red colour; the posterior wings pale.

150. *Phalæna*

## PHALAENA. TORTRIX.

150. *Phalæna Lœfvingiana*. Primary wings yellow, reticulated with lines of a darker colour, and marked with a double X.

*Inhabits* Europe. B.

The Caterpillar feeds on the Oak, and is found in the greatest abundance in April and May; it is of a fine green colour, beset with black specks; the head is shining black, and a collar of the same colour passes round the first segment of the body. It passes to the pupa state in a leaf of the Oak, and in July the Moths are plentiful.

151. *Phalæna Forsterana*. Primary wings dark ash-colour, with two brown spots on the margin.

*Inhabits* England.

The head and thorax are brown, not spotted; the primary wings are somewhat waved with obscure brown points.

152. *Phalæna Bergmanniana*. Primary wings dark yellow, with bright yellow dots; four silvery fasciæ; the third bifid.

*Inhabits* Europe. B.

A very pretty insect. The Caterpillars are yellow, with a streak of green down the back: they feed on white thorn.

153. *Phalæna Yeatiana*. Primary wings grey; with a spot and two dots in the middle, black.

*Inhabits* England.

The body is cinereous, the antennæ black; at the posterior margin are four or five black dots.

154. *Phalæna asperana*. Primary wings white at the base, brown at the apex, and rough.

*Inhabits* Europe. B.

The Caterpillar feeds on the blossom of fruit trees; it is naked and green, the head, the first segment, and the six breast feet, are black; about the middle of June it draws a leaf together, and spins a thin web, within which it changes to a brown pupa, on each segment of which are two rows thick set with spiculæ, of which, those in the first row are the longest; black before. The Moth appears about the middle of July. The thorax is somewhat conical and yellowish white, mixed with cinereous; the base of the wings brown with raised tufts.

## PHALAENA. TORTRIX.

155. *Phalæna squamana*. Green tufted M. Wings greenish and rough.

*Inhabits* England and Germany.

This is exceedingly rare; the upper wings are entirely covered with tufts of feathers, some brownish, others inclining to white, but most of them green. It is taken in June.

156. *Phalæna Conwayana*. Wings ferruginous brown, with silvery dots, and a yellowish spot on the back.

*Inhabits* England.

The head and thorax are cinereous; at the exterior margin of the anterior wings, are two small yellowish spots dotted with brown; the posterior wings blackish.

157. *Phalæna aurana*. Wings brown; with two golden coloured spots.

*Inhabits* England.

The antennæ are short and brown; the body brown; the wings brown and shining.

158. *Phalæna Udmanniana*. Chestnut spot M. Wings cinereous, with a transverse brown spot extending from wing to wing.

*Inhabits* Europe. B.

The Caterpillar feeds on the Raspberry; it is of a pink colour with a black head; it changes in May to a brown pupa, and the Moth appears in July.

159. *Phalæna heracleana*. Wings grey and depressed; the anterior ones brown underneath.

*Inhabits* Europe. B.

The larva is green with black dots; three darker lines on the back; it feeds on umbelliferous plants, particularly the cow-parsnip; it distorts the umbels and destroys the flowers, and then penetrates into the stalk by the axæ of the leaves; the Moth appears in August.

160. *Phalæna cynosbana*. Primary wings brown; white at the tips.

*Inhabits* Europe. B.

The Caterpillar feeds on the buds of the rose; it also lives in the flowers of fruit trees; it is attenuated at both extremities; of a ferruginous colour and black head. The Moth appears at the end of May, or beginning of June.

161. *Phal-*

## PHALAENA. TORTRIX.

161. *Phalæna pomana*. The Codling M. Wings clouded, with a red or golden coloured spot behind.

*Inhabits* Europe. B.

The Caterpillar is naked and red, with a black head; it lodges within apples and pears, and when about to change, it leaves the fruit and becomes a pupa under the bark of the tree, where it remains all winter, and the Moth appears in the June following.

162. *Phalæna Sparrmanniana*. Primary wings pale ash-colour, marked lengthways with the letter S of a ferruginous colour.

*Inhabits* England.

163. *Phalæna Afzeliana*. Primary wings bluish; the base, and a spot on the margin, blackish brown, with a deep black spot in the centre.

*Inhabits* England.

The antennæ palpi, and feet, are brown.

164. *Phalaena Lathamiana*. Primary wings of a pale brick colour, and elevated black dots at the base and apex, with a scaly ferruginous small tuft in the middle.

*Inhabits* England.

The head and palpi are white above.

165. *Phalaena pavonana*. Superior wings clouded with black and buff colour; at the apex a minute representation of a Peacock's feather; a dorsal spot of bright brown, surrounded with a deep black margin. Inferior wings grey brown, with the eye of the peacock's feather at the apex.

*Inhabits* England.

Given from Donovan, Plate 58. It was taken in ~~Suffex~~ in the month of August.

166. *Phalaena interrogationana*. Superior wings dark red-brown, with an undulated line resembling the point of interrogation. Inferior wings and body pale brown.

*Inhabits* England.

Given from Donovan, Plate 65. It is very rare, and has hitherto been taken only in the wilds of Kent.

## PHALÆNA. TORTRIX.

167. *Phalaena cristallana*. Dark button M. Upper wings yellow brown, with dark shades; a broad irregular white mark, and a tuft or button on the centre of each. Head and thorax white clouded; lower wings pale brown.

*Inhabits* England.

Given from Donovan, Plate 97. It is very rarely met with, but has been taken in Coombe wood, Surry, and in Kent, in August.

\*\*\*\*\* *Pyalides*.

168. *Phalaena proboscidalis*. The palpi stretched forward, close, and longer than the thorax; antennæ pectinated; wings grey, with ferruginous streaks.

*Inhabits* Europe. B.

The upper wings brown, the under whitish, with a brown central dot.

169. *Phalaena rostralis*. Palpi stretched out, longer than the thorax; wings somewhat grey, with two prickly dots, and a line at the apex, black.

*Inhabits* Europe. B.

The Caterpillar is naked and green, with fourteen feet; it is marked with oblique streaks and white lines on the sides; it feeds on the hornbeam, hop, and nettle. The pupa is brown, obtuse, and carinated on the fore part.

170. *Phalaena nemoralis*. The palpi recurved, the wings grey, with three brown streaks, the intermediate one waved.

*Inhabits* England.

The wings of a yellowish ash-colour; the second fascia is very slender, and much waved, the third is shaped like a crescent, and broader.

171. *Phalaena palpalis*. The palpi stretched out, longer than the thorax; the wings grey, the posterior ones white on the exterior margin.

*Inhabits* England.

The primary wings are without any spot, and the antennæ are not pectinated.

172. *Phalæna sulphuralis*. Primary wings yellow; with

**PHALAENA. PYRALIS.**

with two lines, five dots and two fasciæ on the hinder part, black.

*Inhabits* England.

Thorax black: the posterior wings brown above, below yellow, with two brown fasciæ and a dot.

173. *Phalaena verticalis*. Mother of pearl M. Wings smooth, pale coloured and somewhat fasciated; underneath waved with brown.

*Inhabits* Europe. B.

The Caterpillar feeds on the nettle; it is hairy, with the head and feet yellow; in the beginning of June it wraps itself up in a leaf, the edges of which it fastens with a thread, and changes to a pupa, from which the Moth comes forth in fourteen days.

174. *Phalaena pingualis*. Palpi recurved; wings cinereous, the exterior margin black, and somewhat fasciated.

*Inhabits* Europe. B.

The Caterpillar lives on fat substances, such as butter and lard, and is not injured by being perfectly besmeared with butter; it is of a pale colour, the first segment brown, the feet light yellow, smooth, and without hair. In May it spins a case of silk, and in 24 hours becomes a brown pupa, from which, in 30 days the Moth breaks forth. The larva sometimes gets into the human stomach, and is then exceedingly dangerous.

175. *Phalaena costalis*. Wings purplish, with two spots on the margin between the base and the apex, and the posterior margin yellow.

*Inhabits* England.

The head is yellow; on the wings are two slender yellow streaks, which terminate in a yellow spot at the exterior margin. Underneath variegated with cinereous and yellow.

176. *Phalaena atralis*. Wings black; with two white spots in each.

*Inhabits* England, Germany, &c.

The thorax is black, with an orange coloured line on each side; the abdomen black with white rings; antennæ setaceous.

*Noctua.*

## PHALAENA. NOCTUA.

\*\*\*\*\* *Noctua*A. *With spreading wings.*

177. *Phalaena Strix* Wings clouded, reticulated with black and white; of the same colour both above and below.

*Inhabits Surinam.*

The *Noctua* with spreading wings are almost all natives of Asia or America. This species is very large and beautiful, the wings measuring, from tip to tip, nine inches. The Caterpillar feeds on the Cambogia Gutta, the tree which yields the Gamboge; it is black, with blue rings, and a yellow lateral line.

B. *With incumbent wings.*

## a. The thorax smooth.

178. *Phalaena pallens*. Wings pale and not spotted, the posterior margins with small black dots underneath.

*Inhabits Europe. B.*

The Caterpillar is hairy, black, and sprinkled with ash-colour, with four white lines; it feeds on the Dandelion; the pupa is brown. The M th is found in June.

179. *Phalaena quadripunctata*. Wings grey, waved with brown, with four black spots on the exterior margin.

*Inhabits England.*

On the posterior wings there is a brown dotted streak along the margin.

## B. b. The thorax crested.

180. *Phalaena Sponsa*. Crimson underwing M. Wings somewhat cinereous, waved with brown; the posterior ones red, with two black fasciæ; the abdomen cinereous.

*Inhabits Europe. B.*

The Caterpillar is knobbed, and furnished with warts upon the back; the head is bluish, the body variegated; it feeds on the oak. The pupa is bluish.

## PHALÆNA. NOCTUA.

181. *Phalæna Nupta*. Red underwing M. Wings somewhat cinereous ; the posterior ones red, with black fasciæ ; the abdomen hoary above ; white below.

*Inhabits* Europe. B.

The Caterpillar is naked and grey, with a truncated wart upon the tail ; it feeds on the Willow, and is found in June and July. It spins a case, in which it turns to a bluish pupa, and in three weeks the Moth appears.

182. *Phalæna Pronuba*. Great yellow underwing M. Posterior wings testaceous ; with a black fascia almost close to the margin.

*Inhabits* Europe. B.

The Caterpillar is naked and greenish, with two black interrupted lines along the back ; it feeds on the leaves of the Stock gilliflower, groundsel, &c. It enters into the earth in May, having lived over the winter, and changes into a pupa, from which, in June, the Moth comes.

183. *Phalæna Fimbria*. Broad-bordered yellow underwing M. Wings grey, and fasciated ; the hinder wings reddish orange, with a black linear spot or bar.

*Inhabits* Europe. B.

The Caterpillar feeds on the Primrose, and the roots of grass, and rarely comes out of the ground to feed, till the evening ; it is of a greyish brown colour, with a pale line along the back ; it passes the winter in the earth, and is full grown early in spring ; the stemmata black, with a white ring ; it goes into chrysalis in May, and the Moth is produced in June.

184. *Phalæna segetis*. Wings ferruginous, with waved streaks of a darker colour, the posterior wings whitish.

*Inhabits* Germany and England.

The Caterpillar is naked, of a livid colour, on each segment four black dots ; the head with two strizæ. It devours the roots of corn.

185. *Phalaena Maura*. Old Lady M. Wings indented, variegated with cinereous and black ; the margin underneath white.

*Inhabits* Europe. B.

The



## PHALAENA. NOCTUA.

The Caterpillar of this species is unknown; the Moth appears in August; it frequents old houses, and flies in the dusk of the evening.

186. *Phalaena Fraxini*. Clifden Nonpareil M. Wings indented, cinereous, and clouded; the posterior wings black above, with a bluish fascia.

*Inhabits* Europe. B.

This is a rare insect in England, and even in France; it is among the largest of this section; the anterior wings have a pretty large white dot in the middle; underneath three fasciæ alternately black and white; all the wings are waved on the posterior margin. The Caterpillar feeds on the ash and the poplar; it is of a dark fuscous colour, with irregular spots of white; the pupa is brown; the Moth is found in July.

187. *Phalaena exclamationis*. Wings brown, with a black line and a heart-shaped spot; the posterior wings black.

*Inhabits* Europe. B.

The Caterpillar feeds on the groundsel; it is of a ferruginous brown colour, with black dots, and a pale line along the back.

188. *Phalaena Brassicae*. Wings cinereous, and clouded; a black hook at the first spot.

*Inhabits* Europe. B.

The Caterpillar feeds on the cabbage; it is brown or green; with a dark line along the back; the stigmata white.

189. *Phalaena chenopodii*. Wings cinerous with black spots; behind a bidentated streak; the crest of the thorax short and bifid.

*Inhabits* Europe. B.

The antennæ are brown; the head and thorax cinereous and not spotted. The primary wings with small black spots particularly along the exterior margin. The Caterpillar feeds on the chenopodium; it is green with a dark line along the back, and a red one on the sides.

190. *Phalaena polymita*. Wings clouded with brown and ash-colour; a black spot at the posterior angle.

*Inhabits* Europe. B.

C. *Witt*

## PHALAENA. NOCTUA.

C. *With deflexed wings.*

## a. The thorax smooth.

190. *Phalaena Batis*. Peach-blossom M. Primary wings brown, with five carnation coloured spots; the posterior wings whitish.

*Inhabits* Europe. B.

One of the rarest of British *Phalænæ*. The Caterpillar feeds on the Bramble; it is naked, of a ferruginous colour, with a gibbosity before and behind. The Moth appears in July.

191. *Phalaena Cerasi*. Wings of a greyish rust colour, with yellowish spots, and a yellow streak behind, the margin with black dots.

*Inhabits* England and Germany.

The Caterpillar feeds on the Lime-tree; it is yellowish, with three sulphur-coloured striæ; the head blue; the pupa is bidentated behind, and not enclosed in a web. The posterior wings of the Moth are cinereous, shining and marked on the under side with a large brown spot in the middle.

192. *Phalæna monilis*. Wings brown, with four close white dots; the antennæ pectinated.

*Inhabits* England.

The primary wings have a dark dot in the middle, and towards the interior margin four close dots placed transversely, of which the first and the third are the least. Towards the apex there are likewise four yellowish obsolete dots.

193. *Phalaena roboris*. Wings cinereous, with two undulated white streaks, a white spot in the middle, and a black crescent.

*Inhabits* Europe. B.

The Caterpillar feeds on the Oak and Hazel; it is naked, green and shining, with two yellow lines on each side: the pupa is black: it is a rare species.

194. *Phalaena quadra*. The yellow July Oak M. Wings yellowish; the primary ones with two bluish black dots.

*Inhabits* Europe. B.

The Caterpillar feeds on the Pine and the Oak: it is hairy, the back marked with red dots, and a black spot; the

**PHALAENA. NOCTUA.**

the sides with black lines; in the middle of June it changes to a black pupa in a chink of the tree, over which chink it spins a strong web: in the middle of July the Moth comes forth. The female wants the dots on the wings.

195. *Phalaena complana*. Wings leaden coloured, pale at the exterior margin; the posterior wings wholly yellow.

*Inhabits* Europe. B.

The Caterpillar feeds on the Oak; it is hairy and black, with two lines of pale dots. The Moth sometimes has the primary wings altogether pale.

C. b. The thorax crested.

196. *Phalaena Chrysis*. Green brazen M. Wings of a shining silvery green; the margin and a fascia grey.

*Inhabits* Europe. B.

The Caterpillar is found on the thistle, the nettle, and on mint: it is solitary, gibbous, and green, with white striz. The pupa is brown. The Moth is common in the beginning of summer.

197. *Phalaena Bralea*. Wings variegated; with a large golden shining spot in the middle.

*Inhabits* Europe. B.

This fine insect has been taken in the neighbourhood of Edinburgh. The head and thorax are of a ferruginous colour. The primary wings are variegated with cinereous and brown, in the middle is a large angulated shining spot, like a bit of gold-beater's leaf. The posterior wings are cinereous.

198. *Phalæna Gamma*. The silver Y M. Primary wings brown, marked with a golden spot like the letter y, or Greek λ.

*Inhabits* Europe. B.

The Caterpillar feeds on sweet herbs and leguminous vegetables; it has twelve feet, and moves like the Geometra; it is green, with three striz on the back, yellow on the sides; the head brown. In August it changes with a slight spinning into a brown pupa, and in September the Moth appears which is very common.

199. *Phalaena interrogationis*. The primary wings variegated

## PHALAENA. NOCTUA.

iegated with brown and ash-colour, and a white mark like the point of interrogation.

*Inhabits* Europe. B.

The Caterpillar is found on the Nettle; the thorax of the Moth is very much crested.

200. *Phalaena Festuæ*. Gold-spot M. Primary wings variegated with yellow and brown, with three silvery spots.

*Inhabits* Europe. B.

The Caterpillar feeds on the stote Fescue grass, the Water cress, and other aquatic plants; it is naked and green: about the end of July, it spins a web of exquisite whiteness on the leaf of some strong aquatic plant, where it changes to a pupa, in which state it remains for three weeks, and from the middle to the end of August the Moth appears; it is one of the rarest and most beautiful of the British Phaenæ.

201. *Phalaena meticulosa*. Angle-shades M. Wings deeply indented, and of a pale colour, with a carnation mark at the base of the primary wings, and a brown triangular spot.

*Inhabits* Europe. B.

The Caterpillar feeds on the Wall-flower, the Nettle, and Dogs-Mercury; it is naked and green with white interrupted lines along the back and the sides. In May or June it changes to a brown pupa, red behind, in a web mixed with earth, which it forms on the ground, and thus remains for a month or two, when the Moth appears.

202. *Phalaena Absinthii*. Wormwood M. Wings hoary, with black fasciæ, and dots placed in a quadrangular manner.

*Inhabits* Europe. B.

The Caterpillar feeds on the Absinthium; it is green with yellow and red lines: the pupa is brown, green before. It has been found in England, but rarely.

203. *Phalaena Pfi*. Dagger M. Wings cinereous; the primary ones with a small black line at the base, and black characters like the Greek  $\psi$ ; the feet not spotted.

*Inhabits* Europe. B.

The Caterpillar feeds on the *Perficaria*, the Alder, Oak,

## PHALÆNA. NOCTUA.

and fruit trees; it is hairy, yellow on the back, the sides black, with red spots; a black erect horn on the thorax; it changes in September, remains in the pupa state during winter, and the Moth appears in May and June.

204. *Phalaena Cbi*. Wings hoary; the primary ones with a black mark like the Greek  $\chi$ .

*Inhabits Europe. B.*

The Caterpillar feeds on the Columbine and Sow-thistle; it is naked and green, with two white lines along the sides; the pupa is brown.

205. *Phalaena Aceris*. Sycamore Tuffock M. Wings hoary, with black undulations; the abdomen on the under side brown at the base.

*Inhabits Europe. B.*

The Caterpillar feeds on the Maple, the Horse Chestnut, and Walnut; it is hairy, with yellow and red tufts, the back spotted with black and white; about the end of August it spins itself up in a web mixed with its own hairs, and continues in the chrysalis state till May or June of the following year.

206. *Phalaena Aprilina*. The primary wings green, with black spots, and triangular dots on each side behind.

*Inhabits Europe. B.*

The Caterpillar feeds on the Oak; it is solitary and smooth, of a cinereous colour, with brown quadrangular spots; the pupa is brown. The Moth appears early in spring; it is very beautiful; on the thorax is a double black arch.

207. *Phalaena Lichenis*. Liverwort M. Primary wings green, with black spots; beneath brown.

The Caterpillar is supposed to feed on the Lichen fusco-ater. The Moth appears early in the spring, and also late in autumn.

208. *Phalaena limbata*. Wings yellowish, with ferruginous streaks; brown behind.

This is the *marginata* of Donovan, Plate 150. fig. 1.

It is a rare insect. The upper wings are yellow-brown, with four streaks of red-brown across each; two circles of the same colour in the middle. Lower wings pale brown, with a band of black next the posterior edge.

204. Pha-

## PHALAENA. NOCTUA.

9. *Phalaena diffinis*. The white spotted pinion M. Wings ferruginous ; with three white spots along the costa ; and two black dots behind.

*Inhabits* Europe. B.

The Caterpillar is found on the Elm ; it is green with white lines ; the head and foremost feet are black ; it changes to chrysalis the latter end of June, and the Moth appears the beginning of July.

10. *Phalaena umbratica*. Shark M. Wings striated, lanceolated, and hoary, with a ferruginous spot in the middle, and two black dots.

*Inhabits* Europe. B.

The Caterpillar feeds on the Sowthistle ; it is naked, blackish, or dark brown, with a triple row of red dots, the last acuminate : in May it changes to a brown pupa, and the Moth appears in June.

11. *Phalaena exfoleta*. Sword-grass M. Wings lanceolated, convoluted, and clouded with brown and ash-colour ; four white dots on the margin.

*Inhabits* Europe. B.

The Caterpillar feeds on the Campanula, Chenopodium, Atropis, &c. ; it is naked, green, and dotted with black ; a white or yellowish line runs along the sides. The pupa is not enclosed in a case ; it changes within the earth in June, and in three weeks the Moth breaks forth.

12. *Phalaena Verbasci*. Water Betony M. Wings deeply indented ; the lateral margin brown and not spotted.

*Inhabits* Europe. B.

The Caterpillar feeds on the Verbascum and Scrophularia ; it is naked, cinereous, dotted with yellow and black ; the pupa is yellowish with black stigmata. About the end of May the Caterpillar goes into the earth, and makes a case composed of earth and a webby matter, which it spins together ; in the month of March thereafter the Moth appears.

13. *Phalaena rurea*. Wings variegated with grey and brown ; the posterior ones brown, the exterior margin white.

*Inhabits* England.

The

## PHALÆNA. NOCTUA.

The head is orange, the eyes black, thorax and abdomen cinereous. The primary wings marked with a small brown line at the inner margin a large brown spot in which there are smaller spots: behind this are three small dots at the exterior margin, and some brown ones scattered on the disc.

214. *Phalæna derafa*. Buff Arches M. Primary wings on the upper side as if bare.

*Inhabits Europe.* B.

This is a rare species; the upper wings are waved with grey, but at the inner margin, on the fore part, there is a triangular space, which appears as if it were bare, though it is nearly covered, and which distinguishes this species from all others. The Caterpillar feeds on the bramble and raspberry, and is found in August and September; the head and whole upper part of the body is orange coloured; on the back, each segment is marked with a brown hexangular spot, and a fine black line runs through the middle of each spot. The Moth appears in June, July, and August of the following year.

215. *Phalæna gothica*. Primary wings brownish, with an arch and a black dot in the middle.

*Inhabits Europe.* B.

The Caterpillar feeds on the oak, various species of *Lonicera*, and the *Galium aparine*; it undergoes its changes in the earth, and scoops out a hole for itself, which it plaisters round with a sort of slime. The pupa is reddish brown, with two aculei behind. The Moth appears in the spring of the following year.

216. *Phalæna pinastri*. Wings black; the inner margin, and posterior angle of a dark ash-colour.

*Inhabits Europe.* B.

The head is black; the antennæ brown; the thorax black with a longitudinal creft, compressed and cinereous. On the primary wings are obsolete spots in rows.

217. *Phalæna Rumicis*. Bramble M. Wings variegated with brown and ash colour, and a white spot at the inner margin.

The Caterpillar feeds on the Dock and the Sowthistle; it is hairy and black, dotted with red and white, and a yellow line along the sides; the pupa is brown. At the beginning of September it changes to a chrysalis, mixing its hairs with the case it spins; the Moth comes forth the May following.



## PHALÆNA. NOCTUA.

218. *Phalaena Oxyacanthæ*. Ealing's Glory M. Wings two-spotted; the inner margin bluish, with a small white crescent-like spot.

*Inhabits* Europe. B.

The Caterpillar feeds on the Orach, the white thorn, and the black thorn; it is smooth, variegated with black and white; the tail gibbous, it forms a fine silky web in the ground, in which it passes to a yellow pupa in May. The Moth does not appear till September; it varies in colours.

219. *Phalaena Myrtilli*. Scarce broad border underwing M. Wings ferruginous with white spots; the posterior ones yellow with a broad black fascia forming the border.

*Inhabits* Europe. B.

The Caterpillar feeds on the *Vaccinium uliginosum*, and *V. myrtillus*; it is naked and green, with five tubercles on the back, the head blue; the pupa is brown with white stigmata. The Moth appears in June; it is a small but beautiful insect.

220. *Phalaena Arbuti*. Wings brown; the posterior ones black, with a yellow fascia.

*Inhabits* England.

On the primary wings, which are shining, is an obsolete waved streak; beneath brown, with a yellow fascia.

221. *Phalaena polyodon*. Wings indented and clouded, a white dentated streak behind.

*Inhabits* Europe. B.

The Caterpillar feeds on the Birch; it is brown, the sides pale, with oblique black lines. The Moth appears in July and August; the posterior margin of the upper wings is terminated with about eight dents.

222. *Phalaena oleracea*. Primary wings ferruginous, with a yellowish lunated mark, and a white bidentated streak behind.

*Inhabits* Europe. B.

The Caterpillar feeds on the roots of kitchen-garden plants, and on the leaves of the pea and bean; it is naked, of a livid colour with black dots, a brown line along the back, and a white one on the sides; the pupa is not enclosed in a case; it is blackish, and frequently dug up with the spade in gardens.



## PHALAENA. NOCTUA.

dens. The Moth is common in May and June, often entering houses by the windows in the evenings.

223. *Phalæna Pisi*. Broom M. Wings ferruginous with two spots, and a pale waved streak behind.

*Inhabits* Europe. B.

The Caterpillar feeds on the broom and leguminous plants; it is naked and ferruginous, with four yellow lines; the head red; in September it goes into the ground to change into a brown pupa, with the edges of the segments red, and the Moth comes forth in June or July of the following year.

224. *Phalæna Atriplicis*. Wild Orach M. Primary wings brown and clouded, with a yellow bifid spot in the middle.

*Inhabits* Europe. B.

The Caterpillar feeds on the Orach and Dock; it is naked and reddish with white dots, and a brown line along the back; in September it goes into the earth and changes to a brown pupa without any case, from which the Moth comes in May of the following year.

225. *Phalæna praecox*. Wings cinereous, with two spots; a red abbreviated fascia, at the posterior margin.

*Inhabits* Europe. B.

This is a very rare insect in Britain. The Caterpillar feeds on the thistle and Sow-thistle; it is naked and grey, with a white line on the back; it lives over the winter, and comes abroad early in spring. Gmelin in his character, has erroneously put *posterioribus* for *pestifer*.

226. *Phalæna triplacia*. Spectacle M. A double arch opposite to one another on each of the primary wings, and three bluish spots between.

*Inhabits* Europe. B.

The Caterpillar feeds on the nettle and sow-thistle; it is naked and green, with two brown protuberances on the back, and another on the tail; it connects the nettle leaves together, and covers them with sand and earth, forming a case; within this case, it spins a very delicate web, under which it changes to a brown pupa; the Moth appears in June; it looks as if it had a pair of spectacles on its eyes, which is the reason of the English name.

227. *Phalæna*



## ALAEANA. NOCTUA.

7. *Phalaena satellitia*. Satellite M. Wings indented and brown; on the upper wings a yellow dot between two small white ones.

*Inhabits* Europe. B.

The Caterpillar feeds on the white thorn, currant, and gooseberry, and is an enemy to other Caterpillars; it is blackish with obscure white lines; and with yellow lines on the neck and tail; the pupa is brown with three dents at the extremity; the Moth appears in July or August.

8. *Phalaena Tragopogonis*. Goats-beard M. Primary wings brown, with three close black dots, the posterior wings livid.

*Inhabits* Europe. B.

The Caterpillar is green, with six white lines, and the stigmata white; it feeds on the goats-beard, spinage, and docks; the pupa is brown.

9. *Phalaena pyramidea*. Copper underwing M. Wings brown, with three waved yellowish streaks; the under wings ferruginous.

*Inhabits* Europe. B.

The Caterpillar feeds on the plumb, walnut, and oak; it is naked and green, with a white line along the back, and another on the sides; on the hind part there is a conical, or pyramidal protuberance. At the beginning of June it changes to a brown pupa, within a fine white silken web between two or three leaves, and the Moth comes forth in July; it is not common.

10. *Phalaena lucipara*. Scare Angle shades M. Wings cinereous and shining, with a broad brown fascia in the middle.

*Inhabits* Europe. B.

The Caterpillar of this species is unknown; it is supposed to feed on the internal substance of willows, as the fly is generally found among those trees.

11. *Phalaena Delphinii*. Pease-blossom M. Wings purplish, with two whitish fasciæ; the posterior wings dark-coloured.

*Inhabits* Europe. B.

The Caterpillar feeds on the Larkspur; it is smooth, naked, yellowish, with black dots, and two yellowish lines;

## PHALAENA. NOCTUA

in August, it turns to a brown pupa under the earth, and in June of the following year, the Moth comes forth; it is a rare insect

232. *Phalaena Citrigo*. The Sallow M. Wings yellowish; the primary ones with three oblique ferruginous streaks.

*Inhabits* Europe. B.

The larva is naked and brown, yellow on the sides; at the beginning of June it enters into the earth, and changes to a brown pupa; in September, the Moth appears, which is not common.

233. *Phalaena Cerago*. Wings yellow, with brown marks resembling fasciæ; the posterior wings white.

*Inhabits* Europe. B.

Found in the neighbourhood of Edinburgh; the thorax is yellow, and the crest in the female elevated and acuminate; the Caterpillar feeds on the willow.

234. *Phalaena fulvago*. Wings yellow, with ferruginous streaks, and dotted behind; the posterior wings white.

*Inhabits* Europe. B.

The Caterpillar feeds on the Birch; it is naked, and of a pale colour, with a brown head.

235. *Phalaena Litura*. Wings hoary, with a black spot in the middle, and a white dot.

*Inhabits* Europe. B.

The Caterpillar feeds on the Willow and the Plumb; it is naked, green, with a pale line along the back; the sides variegated with white and yellow; the head pale.

236. *Phalaena bidentata*. Wings brown; the primary ones with white stigmata on the interior margin, and a bidentated streak in the middle.

*Inhabits* Europe. B.

237. *Phalaena straminea*. Primary wings pale yellow, with a kidney shaped spot of dull grey, enclosed by a dark reddish brown line; a pale brown fascia studded with nine white dots; posterior wings yellowish.

## PHALAENA. NOCTUA.

yellowish white ; pale black behind, with a white fringe.

*Inhabits* England.

Given from Donovan, Plate 61. Found the last week in June, on a blade of grass near Tottenham. The Caterpillar is supposed to be an underground feeder, and to subsist on the roots of grass, &c. ; or one of that kind which comes only above the surface of the earth in the night.

238. *Phalaena funalis*. Festoon M. Upper wings orange, rather inclining to brown ; with a black line nearly of a triangular form on each ; when the wings are expanded, the lines resemble a festoon ; under wings orange, clouded, and frosted with black ; margin pale.

*Inhabits* England.

Given from Donovan, Plate 66. It is also figured in Wilks, Plate 88, and called by him the Small Oak Egger Moth. The Caterpillar feeds on the oak ; it is very singular, being capable of flattening, extending, or contracting itself, and changing its colour. Towards the end of Autumn, it spins a firm, oval, red case, in which it changes to a pupa, and next summer the Moth appears ; it is very rare.

239. *Phalaena aurantiago*. Orange M. Upper wings orange colour, with spots, waves, and streaks of brown ; several minute white dots along the anterior margin ; body, and lower wings, cream colour, with a pale wave in the middle of the latter.

*Inhabits* England.

Given from Donovan, Plate 150. fig. 2. 3. Found in June, on an oak in Richmond park.

240. *Phalaena chrysoceras*. Antennæ yellow, thorax and anterior wings clouded with sulphur and olive colour, the posterior wings light brown.

*Inhabits* England.

The Caterpillar feeds on the Oak ; it is naked, of a pale yellow colour, with two rows of minute white specks, placed longitudinally on the sides, the head red. About the end of June it spins a weak web among the leaves, changes to a brown pupa, and appears as the perfect insect about the second week of April following. It is exceeding rare.

## PHALÆNA. NOCTUA.

241. *Phalaena gemina*. Superior wings of a cinereous brown colour, with two fasciæ composed of streaks, and two white spots between.

*Inhabits* England.

The Caterpillar feeds on the Poplar; it is naked, of a pale yellow colour, without specks, the head red. In the beginning of October, it encloses itself between two leaves, whose edges it unites by a great number of pretty strong threads, changes, to a brown pupa, and about the end of May or beginning of June, next year, the Moth is produced.

242. *Phalaena pulla*. Superior wings somewhat clouded with brown and ferruginous colour, and with a white undulated streak.

*Inhabits* England.

The Caterpillar feeds on the Willow, harbouring at the roots during the day, and ascending in the night to feed: it is of a pale livid colour, along the middle of the back a line of white rhomboidal spots, and a white line along the sides. The last week in May it changes in the earth to a slender brown pupa, and the Moth appears at the end of June.

243. *Phalaena chrysoglossa*. Superior wings grey, somewhat falcated, with three white streaks, the first abbreviated.

*Inhabits* England.

The Caterpillar feeds on the Sallow; it is of a beautiful green colour, long and slender. Towards the end of June it enters into the earth, and about the end of July the Moth appears. The wings are sprinkled with white specks.

These four last given from Mr Beckwith's paper in the Linnæan Transactions, Vol. II.

\*\*\*\*\* *Tinea*.

A. *With four unequal Palpi.*

244. *Phalaena gelatella*. Wings cinereous brown; the primary ones with a white vitta.

*Inhabits* Europe. B.

This species is found in fruit gardens in October; the female has but the rudiments of wings.

245. *Phalaena colonella*. Wings oblong and cinereous,  
with

## PHALAENA. TINEA.

with two black dots before a curved, undulated, obsolete streak.

*Inhabits* the North of Europe. B.

Found on the Alder in July.

246. *Phalaena Euonymella*. Ermine M. Primary wings white, with fifty black dots; the posterior wings brown.

*Inhabits* Europe. B.

The Caterpillar feeds on the Spindle tree, the Bird-cherry, and Service; it is gregarious, that is, lives in society, under a common web; it is naked, yellow, and spotted with black. The pupa is brown. The Moths come forth in June and July, and are very common. There are about twenty-five dots on each wing.

247. *Phalaena Padella*. Least Ermine M. Primary wings livid, with twenty dots; the posterior ones brown.

*Inhabits* Europe. B.

The Caterpillar feeds on fruit trees; it lives in society in a common web; it is naked, grey, with a black dot on each segment on both sides. The pupa is yellowish. The Moth appears about the end of June.

248. *Phalaena pinetella*. Pearl Veneer M. Primary wings yellow, with two very white spots; the first oblong, the other oval.

*Inhabits* Europe. B.

This species is found in Pine woods and on Willows, in June. The under wings are whitish; but underneath, all the wings are brown.

249. *Phalaena pascuella*. Wings cinereous, with a white line; the posterior margin dotted with black.

*Inhabits* Europe. B.

Common in meadows.

250. *Phalaena pratella*. Primary wings cinereous, with a white line branching, at the further extremity, into oblique striæ.

*Inhabits* Europe. B.

It is found in meadows and grassy places frequent.

## PHALAENA. TINEA.

251. *Phalaena culmella*. Wings cinereous, with a single white abbreviated line.

*Inhabits* Europe. B.

It is frequent in meadows and pastures: it varies much in colour: the extremities of the wings in some appear gilded. It appears in June and the following summer months, often sitting on the stalks of grass, with its head downwards.

252. *Phalaena gramella*. Wings cinereous, with two angulated brown streaks, and a silvery one made up of spots.

*Inhabits* England.

The two streaks form an angle in the middle; the hinder margin is terminated by a silvery streak.

253. *Phalaena nemorella*. Wings whitish, and incurvated; on the primary ones a black dot.

*Inhabits* Europe. B.

The dot is situated near the interior margin of the upper wings.

254. *Phalaena salicella*. Wings of a blue cinereous colour; whitish dots on the back; the thorax crested.

*Inhabits* Europe. B.

The Caterpillar feeds on the Willow; it has sixteen feet, and a fascia with white spots: the pupa is black before, brown behind.

255. *Phalaena tapezella*. Wings black, whitish behind; the head white.

*Inhabits* Europe. B.

The Caterpillar harbours on woollen stuffs and skins, making cylindrical passages for itself: the Moth is very common.

256. *Phalaena pellionella*. Wings hoary; a black dot in the middle; the head grey.

*Inhabits* Europe. B.

This is likewise very common. The Caterpillar lodges in clothes, which it destroys: it is whitish, with a red line along the back; the pupa is yellowish.

257. *Phalaena fascitella*. Wings cinereous; the thorax with a white dot on each side.

*Inhabits* Europe. B.

The

## PHALÆNA. TINEA.

The Caterpillar lodges in clothes and skins, which it destroys, lurking in a cylindrical case like a hood.

258. *Phalæna stigmatella*. Wings ferruginous and almost linear, with a white spot on the costa.

*Inhabits* England.

It is small and compressed; the antennæ whitish; the primary wings ascending, shining, with a large white spot in the middle of the costa, from which a dent juts out, which almost reaches the exterior margin; the feet ferruginous; white at the apex.

259. *Phalæna Mellonella*. Wings hoary, purplish behind; with a white streak; the scutellum black; white at the apex.

*Inhabits* Europe. B.

The Caterpillar of this insect infests Bee-hives, making cylindrical narrow passages, by which it arrives at the combs and destroys them. It is of a carnation colour, the head red. It was introduced into Stockholm in the year 1760, by means of Bee-hives brought out of Germany.

260. *Phalæna proletella*. Wings whitish, with two brown dots; the tongue inflected.

*Inhabits* Europe. B.

The Caterpillar is found on the Cabbage, Celandine, and perhaps likewise on the Oak. The Moth is capable of producing 200,000 descendants in one year.

261. *Phalæna clematella*. Primary wings white, with a small line at the base; a fascia in the middle, and a dot at the apex, black.

*Inhabits* England.

The Caterpillar feeds on the Clematis. The Moth is small, with a brown head, the thorax white.

262. *Phalæna strobilella*. Wings waved with brown and white; the posterior wings brown, with a white margin.

*Inhabits* Europe. B.

The Caterpillar harbours in the cones of the Fir-tree. The Moth appears in the beginning of spring; the exterior margin is marked with many transverse white striæ. The under wings brown, the posterior and inner margin white.

263. Pha-



## PHALAENA. TINEA.

263. *Phalaena turionella*. Wings greyish white, somewhat shining; the thorax yellow.

*Inhabits* Europe. B.

The Caterpillar resides within the young shoots of Scots Fir: the white on the wings of the Moth, appears made up of various unequal silvery fasciæ.

264. *Phalæna dodecella*. Grey, dotted with black; wings with pale fasciæ, and three rows of black dots.

*Inhabits* Europe. B.

The Caterpillar is found, like the former, in the young shoots of the Scots Fir; the larva and pupa are ferruginous, the former smooth, the latter conical.

265. *Phalæna Cembrella*. Wings brown, sprinkled with numerous whitish minute points.

*Inhabits* Europe. B.

The Caterpillar feeds on the Scots Fir, and dwells in a rough case; the wings of the Moth are obtuse, and sprinkled with white points as to appear cinereous.

266. *Phalæna tædella*. Wings brown, with three fasciæ, and as many white bifid spots.

*Inhabits* Europe. B.

Feeds on the Silver Fir. A small species.

267. *Phalæna corticella*. Wings grey, with golden on the margin, and three lunated spots behind.

*Inhabits* Europe. B.

The Caterpillar is found within the bark of Evergreen and fruit trees.

268. *Phalaena capitella*. Wings brown; with yellowish spots; the head ferruginous.

*Inhabits* Europe. B.

Found in woods; the posterior margin of the wing yellowish.

269. *Phalæna compositella*. Wings brown; on back a large silvery spot composed of four streaks.

*Inhabits* England.

A small species; the forehead white; the antennæ black. Wings shining; the exterior margin with silvery streaks.

## PHALAENA. TINEA.

270. *Phalæna argentella*. Wholly silvery; the antennæ annulated with brown.

*Inhabits* Europe.

The Caterpillar feeds on the Bramble and Nettle; it is gregarious, smooth, and brown; the pupa is light brown, inclosed in a white case. The Moth is very small.

271. *Phalæna Seppella*. Wings bronzed; with two silvery streaks.

*Inhabits* England.

The body is black; the antennæ short; the anterior wings shining, with two straight silvery streaks. The posterior ones are also shining and gilded.

272. *Phalæna Goedartella*. Wings gilded; with two fasciæ and three dots, silvery.

*Inhabits* Europe. B.

The Caterpillar resides in the buds of the Alder and Birch, sitting on four feet only, the last two being stretched out. The Moth is small, the first fascia is arched forwards, the other backwards.

273. *Phalæna Merianella*. Wings black; with three silvery fasciæ, transversely divaricated.

*Inhabits* Europe. B.

The Caterpillar feeds on the Plumb and the Bird-cherry. The Moth is very small, oblong, black, and semicylindrical. When the insect is preserved, the black turns to a golden colour.

274. *Phalæna Schæfferella*. Wings black; the disc golden, with a streak, two lines behind, and three dots, silvery.

*Inhabits* Europe. B.

The Caterpillar feeds on the leaves of the Beech. The Moth is very beautiful, and if it were large would be preferred by the Collector to all other European Moths. It is easily distinguished by the black colour of the wings, and the yellow disc.

275. *Phalæna Gleichennella*. Wings flat and black; with a fascia in the middle, and two opposite spots at the apex, silvery.

*Inhabits* England.

A small species; the antennæ short and black; the body  
Vol. II. C c black,

## PHALAENA. TINEA.

black, and shining with silver. The posterior wings are cinereous.

276. *Phalaena Roefella*. Wings black and gilded, with nine silvery dots, convex, and situated nearly on the margin.

*Inhabits* Europe. B.

A small but very beautiful species. The upper wings are yellowish, with an oblong black spot at the base, and a transverse black fascia. The black in the wings, when the insect is dead, disappears, and changes into a very bright silver colour. The Caterpillar feeds on the apple, subcutaneous.

277. *Phalaena Schreberella*. Wings gilded; at the base two fasciæ, and at the apex two spots, silvery and shining.

*Inhabits* England.

Small and pretty; the posterior wings cinereous, the feet silvery and shining.

278. *Phalaena Harrisella*. Wings of a yellow silvery colour, the apex obtuse, dark brown, with something like an ocellus.

*Inhabits* England.

The wings are variegated with gold and silvery colour.

279. *Phalaena Cramerella*. Wings of a pale silvery colour, with a black terminating dot.

*Inhabits* England.

Wings pale, darker behind, with nine silvery spots, of which five at the anterior margin, and four at the interior; the second spot is long transversely and almost joins the second spot on the interior margin. A small species.

280. *Phalaena Blancardella*. Wings bronzed, with a small line at the apex, and seven spots on the margin, silvery.

*Inhabits* England.

Small. On the wings four spots at the exterior, and three at the interior margin, all behind the middle. The posterior wings are very hairy, silvery, and without any spots.

281. *Phalæna pruniella*. Wings underneath brownish, dark behind, the head white, with a white line

## PHALAENA. TINEA.

line on the back crossing a brown transverse one.

*Inhabits* Europe. B.

The Caterpillar harbours in the flowers of the cherry, and having destroyed the parts of fructification, it connects them with a thread; it is of a whitish green colour: the head and first segment of the body brown and shining.

B. *With two palpi, cleft to the middle.*

282. *Phalæna granelia*. Wings variegated with white and black, the head white.

*Inhabits* Europe. B.

The Caterpillar is found in granaries, gnawing and gathering the seeds into little heaps; in winter it creeps up the walls; it is naked and white; the head brown; the pupa is brown and attenuated.

283. *Phalæna niviella*. Wings white, with two black spots on the margin, and a black fascia in the middle; the head white.

*Inhabits* England.

The colour of the spots varies; sometimes they are brown. The posterior wings are cinereous.

284. *Phalæna Lappella*. Wings pale, with a black dot, turning up at the apex.

*Inhabits* Europe. B.

The Caterpillar harbours among the seeds of the Burdock; it has but six feet. The Moth is of the size of the *tapezella*.

285. *Phalæna marginatella*. Wings of a shining brown, with white margins.

*Inhabits* England.

Found on the Juniper; middle sized, the palpi thick; the head white; the antennæ brown.

286. *Phalæna Xylostellæ*. Wings of a dark cinereous colour, with a white sinuated vitta on the back.

*Inhabits* Europe. B.

It is found on the *Lonicera Xylosteum*, and the *Wall-flower*. It appears brown when sitting, but there is a yellowish white stripe that stretches from the apex of the rostrum, to the middle of the wings. The points of the wings turn up and gape. The antennæ are stretched straight forward, and are distant.

287. *Phalæna costatella*. White; wings of a reddish bronze,

## PHALÆNA. TINEA.

bronze, with a white spot on the margin at the base, dotted with brown.

*Inhabits* England.

Found in woods; at the posterior angle there is a white spot.

288. *Phalaena asperella*. Primary wings whitish, with two blackish spots, emarginated at the apex.

*Inhabits* Europe. B.

The palpi are porrected. The spot on the back of the wings is rough, the scales being recurved. The under wings are emarginated; the upper lobe rounded.

289. *Phalaena fasciella*. Wings bronzed, with a brown fascia; antennæ much longer than the body, and white at the tips.

*Inhabits* England.

Found in woods; it is blackish; in some specimens, the head ferruginous; the thorax gilded, and the antennæ about the length of the body.

290. *Phalaena striella*. Wings bronzed, with yellow striæ; a yellow fascia in the middle, with a copper coloured margin.

*Inhabits* England.

The head is sometimes black, sometimes orange; the antennæ are sometimes much longer than the body, sometimes only a little longer, rough, and black at the base, white at the tips.

291. *Phalaena sulphureatella*. Primary wings bronzed, with two sulphureous opposite spots, the posterior wings yellow.

*Inhabits* England.

Found in gardens: near the interior margin, is a large triangular yellow spot, and another smaller at the exterior margin.

292. *Phalaena oppositella*. Wings brown, with two opposite yellow spots; the posterior wings lighter brown.

*Inhabits* England.

Like the preceding. Wings plane, incumbent, and dark brown, not shining, with two equal yellow spots, the one at the interior, the other opposite, at the exterior margin; the posterior wings, head, and thorax, brown. The position of the wings gives it the habit of a *Pyrallis*.

293. *Phalaena*

## PHALAENA. TINEA.

293. *Phalaena Degeerella*. Long-horned Japanned M. Wings black, and gilded, with a yellow fascia; antennæ longer than the body.

*Inhabits* Europe. B.

Not uncommon in hedges in May and June. The antennæ in the female are very long; on the male, they are shorter, and thick in the middle. They are so strong, that the insect may be held by them.

294. *Phalaena Podacilla*. Scarce Japanned M. Antennæ the length of the body; wings black, with a white fascia.

*Inhabits* Europe. B.

Like the preceding species, the antennæ of the female are remarkably long; of the male shorter.

## \*\*\*\*\* Alucitæ.

295. *Phalaena didactyla*. Brown feathered M. Wings spreading, cleft, and brown, with white streaks; the anterior ones bifid; the posterior ones divided into three.

*Inhabits* Europe. B.

The Caterpillar, which feeds on the *Geum rivale*, and *Convolvulus*, is green, with hairy tufts. The pupa is elongated, with two lines of tubercles, each tubercle having four spines.

296. *Phalaena tridactyla*. Wings pale and cleft, with whitish lines; the anterior ones bifid; the posterior ones divided into three.

*Inhabits* Europe. B.

Found in gardens. The upper wings bifid; the under, trifid.

297. *Phalaena pentadactyla*. Wings white, the anterior bifid, the posterior divided into three.

*Inhabits* Europe. B.

The Caterpillar and pupa are both hairy, green, and dotted with black; the former has a white line along the back. The Moth is frequent, and larger than the other species of this section. The inferior wings appear divided into five; the fifth unconnected.

298. *Phalaena hexadactyla*. Many feathered M. Wings spreading

## LIBELLULA.

the abdomen depressed, and covered with down.

*Inhabits* Europe. B.

The thorax is hairy, with two yellow spots, one of them bilobated; the wings white; towards the base yellow; the under wings, close to the body, black. The sides, and back of the abdomen, yellow. Berkenhout says he took this species on board the Harwich packet, many leagues from land.

2. *Libellula flaveola*. Wings yellow at the base.

*Inhabits* Europe. B.

The back is yellow; underneath wholly black: the thorax black, with two oblique yellow spots on the sides, besides two yellow lines. Feet black; forehead greenish, eyes grey. On the margin of the wings, towards the extremity, a brown spot.

3. *Libellula vulgata*. Wings pellucid, and without spot; the abdomen cylindrical and red.

*Inhabits* Europe. B.

Wings whitish; no spots at the base, but a reddish brown marginal dot. Body blackish; no appendage at the tail.

4. *Libellula rubicunda*. The posterior wings alone blackish at the base; the body long and square.

*Inhabits* Europe. B.

Face white; thorax black, with pale brown and red lines, the back, between the wings, bright red: feet black; wings pellucid, with a ferruginous marginal spot; the inferior ones black at the base; the abdomen black, with large red spots on the back. The female is yellow, where the male is red.

5. *Libellula depressa*. All the wings blackish at the base; the abdomen depressed; the sides yellowish.

*Inhabits* Europe. B.

The abdomen of the male is bluish, of the female brown; the insect is on the wing in May and June, in almost every marshy situation: the female lays her eggs near the roots of Otters, on the banks of ditches, or sinks them into the stalks of rushes in the water; the larva has a long body like the fly, six legs and a forked head; a sharp spine at the bottom of the abdomen, and a row of spines on each side, one at every joint.

6. *Libellula vulgarissima*. The thorax yellow, with three black striae.

*Inhabits* Europe. B.

The

## LIBELLULA.

The sides of the thorax and abdomen are yellow: the wings white, not yellow; the back with a brown longitudinal line: the marginal dots on the wings ferruginous brown.

7. *Libellula cancellata*. Wings not spotted at the base; the abdomen, back, and sides yellow, interrupted with black:

*Inhabits* Europe. B.

The face is pale; the forehead black; the thorax has brown and yellow fasciæ; the abdomen is yellow on the back, with two black longitudinal lines on each side, and the margins of the segments black.

8. *Libellula aenea*. Wings pellucid; the thorax of a brassy green.

*Inhabits* Europe. B.

The head and thorax green and shining. Wings yellowish white; in some yellow at the base. The marginal dot brown: the abdomen cylindrical and black, underneath yellow, the margin gilded.

9. *Libellula grandis*. Thorax with four yellow lines, the abdomen variegated.

*Inhabits* Europe. B.

This is the largest of the European species of Dragon flies, and is almost every where common where water is at no great distance. The abdomen is long, narrow, of a reddish brown colour, sometimes with white spots; the thorax with two obliquely transverse yellow lines on each side. Wings yellow, with a ferruginous spot.

10. *Libellula forcipata*. Thorax black, with various yellow marks; the appendage at the tail like claws.

*Inhabits* Europe. B.

This species is among the largest of the genus: The tail of the male is armed with two large nails or claws, and two small points underneath; the tail of the female with two points. The wings are pellucid, with a marginal dot, and a transverse line in the middle.

\*\* *Wings, when at rest, erect.*

11. *Libellula Virgo*. Wings coloured.

*Inhabits* Europe. B.

This species varies much in the colour of the wings, which are sometimes bluish, brownish, black, pellucid with a broad black fascia, pellucid with white tips, or with brown tips and a white dot.



## LIBELLULA.

12. *Libellula Puella*. Wings pellucid.*Inhabits* Europe. B.

This species likewise varies much in the colour of the body, which is sometimes bluish, and sometimes red; the marginal dot on the wings is sometimes brown, and sometimes black, &c.

GEN. LXXIV. EPHEMERA. Mouth without any mandible. Palpi four, very short, and filiform. Maxilla short, membranous, cylindrical, connected with the lip. Antennæ short, and subulated. Two large stemmata above the eyes. Wings erect, the hind ones very small. Setæ at the tail.

The insects of this genus have their name from the shortness of their life after they become perfect, for they have previously lived one, two, or three years in the water as larvæ and pupæ. Some species live only a day, and others, as it is said, only a few hours. The larvæ have six feet, and six plumated fins on the sides of the abdomen, by which they swim: the pupa differs little, except in having at the thorax the cases which inclose the future wings. When about to undergo the last change, which happens generally about the end of May or beginning of June, the pupa approaches the land, and settles on a dry place; the skin bursts at the head and thorax, and the fly immediately appears with its wings extended, and takes flight. But what distinguishes the Ephemera from all other insects is, that it has still another skin to get rid of. For this purpose it settles on a near object, a wall, or a tree, and this second operation lasts longer than the first; sometimes it requires several hours, but in some small species only a few minutes, to disengage the insect from this last covering. A person standing by a pond or brook, in a close evening, in the beginning of June, will soon have his cloaths covered with these exuviae. The creature being now the perfect insect, hastes away to perform the remaining function of its nature. The males fill the air for a few hours after sun-set, and the females hover upon the surface of the water to drop their eggs. In this period of their existence they take no nourishment, and therefore soon die.

The

## EPHEMERA.

\* *The tail with three setæ.*

1. *Ephemera vulgata*. May-fly. Wings reticulated, and spotted with brown; the body brown.

*Inhabits* Europe. B.

This is the largest of the British species. In the evening in the month of June, it assembles in vast numbers under trees near waters, and seems to divert itself, for hours together, ascending and descending in the air as if dancing. In the neighbourhood of Laz, in Carniola, these insects are produced in such quantities that, when they die, they are gathered for dung to the ground by the country people, who think they have been unsuccessful, if each does not procure twenty cart-loads of them for that purpose. Their larvæ are the favourite food of fresh water fishes, as are also the flies: they are more numerous in running than in standing waters.

2. *Ephemera marginata*. Wings white, the exterior margin brown; the body black.

*Inhabits* Europe. B.

This resembles the former species, but is less.

3. *Ephemera vespertina*. Wings black, the under ones white.

*Inhabits* Europe. B.

\*\* *Tail with two setæ.*

4. *Ephemera bioculata*. Wings white, and reticulated; the head with two yellow tubercles.

*Inhabits* Europe. B.

The setæ at the tail are longer than the body, and white with brown dots.

5. *Ephemera nigra*. Body black, wings blackish; the under ones very small.

*Inhabits* Europe. B.

The under wings are so small as to be hardly visible; the inner margin of the upper wings somewhat ciliated.

6. *Ephemera culiciformis*. Wings white, body brown.

*Inhabits* Europe. B.

A little larger than a gnat; the thorax blackish; two large livid tubercles above the eyes.

7. *Ephemera boraria*. Wings white, the exterior margin blackish.

*Inhabits* Europe. B.

**EPHEMERA.**

This species appears to have six eyes, viz. two large reddish brown tubercles, the two reticulated eyes, and two smaller eyes, placed before the tubercles. Towards evening the larvæ rise from the water, carrying with them their second pupal covering, which they deposit wherever they first alight, whether on walls, windows, or the cloaths of passengers. They live but for a night.

8. *Ephemera striata*. Wings pellucid and striated, thorax brown, abdomen white.

*Inhabits* Europe. B.

A small species; the tail wants the setæ.

9. *Ephemera diptera*. With only two wings, the exterior margin brown, with cinereous spots.

*Inhabits* Europe. B.

Of middle size. The margin of the wings as if inscribed with whitish characters.

**GEN. LXXV. PHRYGANEÆ.** Mouth furnished with a horney, short, arched, acute mandible, without teeth; and a membranaceous maxilla. Four palpi: three stemmata; antennæ setaceous, longer than the thorax; wings incumbent; the hinder ones folded.

The larvæ of all the insects of this genus live in fresh waters, forming to themselves a case of silk, covered on the outside with small pieces of wood, sand, gravel, leaves of plants, &c.; their head and thorax are horny, and they have six feet; they feed on aquatic plants and insects. When about to undergo their transformations, they quit their case, and rising to the surface of the water, they look about for a dry place on which they may prepare for appearing as perfect insects. Having settled, the skin of the pupa soon dries and splits; the insect draws itself out, and, leaving its spoils, retires to a little distance that its parts may acquire their proper consistence. The smaller species, however, are not under the necessity of quitting the water for this purpose, but disincumber themselves sitting on the surface. Phryganææ are the favourite food of Swallows; and the larvæ are used by fishermen for bait; in some parts of Holland they are so abundant, as to be used for manure.

*The*

## PHRYGANEÆ.

\* *The maxilla bifid, the tail with two truncated setæ.*

Sembris, Fabr.

1. *Phryganeæ bicaudata*. Wings with reticulated veins.  
*Inhabits Europe.* B.

This species varies in size. Wings are oblong and incumbent, not deflexed. The two setæ of the tail are as long as the antennæ.

2. *Phryganeæ nebulosa*. Wings nearly cinereous.  
*Inhabits Europe.* B.

Frequent in the beginning of spring. Antennæ setaceous, of the length of the body, but not of the wings; thorax narrow and marginated. Tail terminated by two truncated and very short setæ. Whole body black except the wings. Wings incumbent, forming a semi-cylindric figure, somewhat cinereous, with whitish spots or fasciæ.

3. *Phryganeæ striata*. Black; wings testaceous, and striated with veins.  
*Inhabits Europe.* B.

Has the habit of a large phalæna. Antennæ are stretched out forwards, of the length of the body. The wings are large, broad, and somewhat striated with branching veins, but not reticulated; a white dot behind in the upper wings.

4. *Phryganeæ grisea*. Of a grey colour, the upper wings clouded with a black spot at the margin.  
*Inhabits Europe.* B.

The larva lives in a cylindrical case, formed of the stems of grasses and rushes. The wings of the fly are incumbent, compressed behind.

5. *Phryganeæ flavicornis*. Wings grey, abdomen greenish; the antennæ and feet yellowish.  
*Inhabits Europe.* B.

Like the preceding species, but a little larger. The wings are grey, or rather cinereous, with a tinge of brown. The antennæ and feet are yellowish; the abdomen is greenish, which is uncommon. Found by Duddingston Loch, near Edinburgh.

6. *Phryganeæ grandis*. Wings of a testaceous brown colour, with ash-coloured spots.  
*Inhabits Europe.* B.

On the upper wings are two longitudinal lines and a white dot in each wing. Antennæ long, and stretched straight out.

7. Phry-

## PHRYGANEÆ.

7. *Phryganea varia*. Wings greyish brown, variegated with black, and spotted in the middle with white.  
*Inhabits* Europe. B.

Given from Donovan, Plate 277, fig. 1. Like the preceding species, but less.

8. *Phryganea rhombica*. Wings grey, with a white lateral spot of a rhombic figure.  
*Inhabits* Europe. B.

The wings are large, transparent, compressed and deflexed; behind the white spot is another hardly perceptible. This is among the largest of the genus. The larva makes a cylindrical case of small bits of the stalks of grass laid transversely on each other.

9. *Phryganea flavilatera*. Wings reticulated, the sides of the thorax yellow.  
*Inhabits* Europe. B.

When at rest its wings are deflexed like those of a *phalæna* or rather like those of the *phalæna quercifolia*. The wings are reticulated with brown veins, especially at the outer margin, which is much dilated. Antennæ half the length of the body.

10. *Phryganea nigra*. Wings black, antennæ double the length of the body.  
*Inhabits* Europe. B.

Not only the wings but the body of this species is black; the antennæ remarkably long.

11. *Phryganea variegata*. Wings brown, sprinkled with testaceous minute dots.  
*Inhabits* Europe. B.

Of middle size; the feet yellowish. Found in the neighbourhood of Edinburgh.

12. *Phryganea longicornis*. Wings brown, with waved streaks of a darker colour; the antennæ very long.  
*Inhabits* Europe. B.

The antennæ of this species are still longer in proportion than those of the former, being three or four times the length of the body.

13. *Phryga*

## PHRYGANEÆ.

13. *Phryganea filosa*. Wings rounded, brown, and not spotted; the antennæ three times the length of the body.

*Inhabits* England.

The antennæ are annulated with white and brown; the first articulation hairy; the abdomen black; the feet pale.

14. *Phryganea interrupta*. Black, the wings brown, with four white fasciæ, the anterior ones interrupted, the last marginal and dotted,

*Inhabits* England.

The antennæ are longer than the body, annulated with black and white; head and thorax black; the palpi pale.

15. *Phryganea hirta*. Brown, the anterior wings rough; the antennæ of the length of the body.

*Inhabits* England.

Found at Oxford; antennæ white, annulated with brown, the first articulation longest and round. Head and thorax brown, rough, and not spotted; two dark obsolete spots on the wings, the one at the inner margin, the other in the middle.

16. *Phryganea fusca*. Anterior wings brown and not spotted; feet yellow.

*Inhabits* Europe. B.

GEN. LXXVI. HEMEROBIUS. Mouth with a short horny mandible; a cylindrical, straight, cleft maxilla; lip stretched forward and intire; four projecting, unequal, filiform palpi. No stemmata. wings deflexed, not folded. Antennæ setaceous, projecting, and longer than the thorax, which is convex.

The species of this genus, in all their stages, feed on small insects, especially the Aphides; their larvæ have six feet; in most species they are oval and hairy: the pupæ are inactive, and inclosed in a case. The eggs are deposited on leaves, in the midst of Aphides; they are supported on small pedicles, and set in the form of bunches. The larvæ attain their growth in fifteen or sixteen days, and the pupa *incompleta* remains for three weeks before the fly comes forth.

## 1. Hemerobius

## HEMEROBIUS.

1. *Hemerobius lutarius*. Black, wings whitish, striated, and spotted with white.

*Inhabits* Europe. B.

This species is frequent in Spring; it glues a great number of brown eggs close together on aquatic plants. The wings are longer than the body.

2. *Hemerobius Perla*. Of a greenish yellow colour; the wings pellucid, with green nerves.

*Inhabits* Europe. B.

Frequent in gardens. Wings large and reticulated, with an oblong green spot on the margin. The eyes large, spherical, and of a golden colour; the body is likewise green; when touched, it has an excrementitious smell: the eggs are elevated on a pretty long pedicle.

3. *Hemerobius Chrysops*. Variegated with green and black; wings pellucid, reticulated with spots.

*Inhabits* Europe. B.

Found in woods, and is among the larger species; the wings have many brown veins at the inferior margin, and two strong ones on the inner margin above the back; it is not very common.

4. *Hemerobius phalænoides*. Of a testaceous colour; at the base, the wings armed with a point, appearing as if cut off behind.

*Inhabits* Europe. B.

Somewhat like a phalæna. Wings very broad, short, and reticulated with veins. Above the base of the upper wings, a prominent point.

5. *Hemerobius hirtus*. Yellowish; wings white, with brown streaks.

*Inhabits* Europe. B.

Found on the hop, and hazel. It conceals itself in the middle of the day among the foliage, or flies only in moist, shady places. The under wings are whiter, and have fewer veins than the upper. The abdomen is terminated by a forceps.

6. *Hemerobius sexpunctatus*. Wings white, with brown spots, and six distinct dots behind; the antennæ brown.

*Inhabits* Europe. B.

The

## HEMEROBIUS.

The wings, held in a certain light, appear gilded.

7. *Hemerobius abdominalis*. Brown, the abdomen yellow; the tail black.

*Inhabits* England.

Very small: the antennæ short and brown; the wings white, with brown spots.

GEN. LXXVII. MYRMELEON. Mouth with a horny acute mandible and maxilla; the lip projecting; palpi six. No stemmata. Antennæ thicker towards the extremities. Wings deflexed; the tail of the male armed with a forceps rising out of two straight filaments,

The insects of this genus, in all their stages, live on ants, and other insects; their larvæ have six feet; they are ovate, hairy, with dentated exerted maxillæ; the pupa is incurved, and remains inactive in the earth.

*Myrmeleon formicarius*. Lion Ant. Wings clouded with brown and a white marginal spot behind.

*Inhabits* Europe. B.

The abdomen of the larva is large, oval, marked with five rows of rough papillæ; the thorax angulated; the mouth armed with a long forceps, meeting at the apex; it walks backwards, and, with its abdomen, digs cavities in the dry sand, in which it lives. These cavities are in the shape of a funnel, into which, when any insect falls, it is immediately seized by the larva, with its forceps, and devoured. When arrived at its full growth, it spins a globular case, and turns to a pupa *incompleta*, and, after a certain period, the winged insect appears. See Plate VII. fig. 12, 13, 14, and 15.

GEN. LXXVIII. PANORPA. Scorpion fly. Mouth stretched out into a cylindrical horny rostrum; the mandible is without teeth; the maxilla bifid at the apex; the lip is elongated, covering the whole mouth; these three parts likewise horny and projecting. Four palpi nearly equal: three stemmata.

VOL. II.

E c

Antennæ



## PANORPA.

Antennæ filiform, longer than the thorax : the tail of the male armed with a chela, that of the female unarmed.

*Panorpa communis.* Wings equal, spotted with black.

*Inhabits* Europe. B.

This is a very common insect ; though its larva is as yet unknown ; it lives chiefly on insects of the dipterous order. It is the only species of the genus that is known in Britain.

GEN. LXXIX. RAPHDIA. Mouth with an arched, dentated, horny mandible ; a cylindrical, obtuse, horny maxilla ; a rounded, intire, and horny lip. Palpi four, very short, nearly equal, and filiform. Three stemmata. Wings deflexed. Antennæ filiform, of the length of the thorax, elongated before, and cylindrical. Tail of the female with a lax recurved seta.

The larva of these insects is very like the perfect fly, only it wants the wings ; both feed on insects.

1. *Raphidia Ophiopsis.* Wings not spotted.

*Inhabits* Europe. B.

Found chiefly in Pine forests, feeding on other insects ; the larva has six feet ; the pupa is active, and like the perfect insect, except in wanting wings.

2. *Raphidia notata.* Wings with a brown spot on the margin.

*Inhabits* England.

Like the former species, but a little larger ; black, with a testaceous spot on the head, and the feet of the same colour ; an exerted aculeus of the length of the abdomen.

**GEN. LXXX. CYNIPS.** Mouth with a short, membranaceous maxilla with one dent; an arched, horny mandible, cleft at the apex; a short, cylindrical, intire, horny lip; four short, unequal, capitated palpi. Antennæ moniliform, aculeus, spiral, and, in general, hidden within the body.

The Cynipæ pierce the leaves, &c. of plants with their  
sting, and deposit their eggs in the wound; the extravasated  
juices

† From *ὑμὴν*, a membrane, and *πτῆρ*, a wing.

**CYNIPS.**

juices rise round it, and form a gall, which becomes hard and in this the larva lives and feeds, and changes to a pupa. Some species of this genus likewise lay their eggs in the bodies of other insects.

1. *Cynips Rosæ*. Black, the abdomen ferrugineous, behind black; the feet ferruginous.

*Inhabits Europe.* B.

The prickly excrescences found on the branches of the *Rosa canina*, and other roses, are the production of this species; these were formerly an article in the *Materia medica*, under the name of *Bedeguar*. The insect is small. Antennæ black. Abdomen shorter than the wings. Wings white, without any marginal spot.

2. *Cynips glebomatis*. Brown, the thorax villous.

*Inhabits Europe.* B.

The larva is found in rough, spherical galls, formed on the leaves of the ground ivy.

3. *Cynips quercus baccarum*. Black, the antennæ at the base, and the feet yellowish.

*Inhabits Europe.* B.

The larva is found in somewhat globular pellucid galls, adhering to the under surface of the leaves of the Oak, and of the size of peas.

4. *Cynips quercus folii*. Black, the thorax marked with lines; the feet grey; the thighs black underneath.

*Inhabits Europe.* B.

The larva is found in galls, adhering to the under side of Oak leaves, and of the size of hazel nuts.

5. *Cynips quercus petioli*. Black, the feet white; the thighs brown.

*Inhabits Europe.* B.

The larva is found in hollow galls, convex on both sides, adhering to the footstalks of oak leaves.

6. *Cynips quercus gemmæ*. Greenish black, a little bronzed, antennæ and legs orange.

*Inhabits Europe.* B.

The larva is found in an imbricated gall, adhering to the terminating bud of an oak.

7. *Cynips*

## CYNIPS.

7. *Cynips Fagi*. Black, and not spotted.

*Inhabits* Europe. B.

The larva is found in pear-shaped galls, resting on the upper surface of the leaves of the beech.

8. *Cynips viminalis*. Yellow, the thorax black.

*Inhabits* Europe. B.

The larva is found in galls, under the middle rib of the leaves of the *Salix viminalis*.

9. *Cynips Pfenesi*. The Cynips of the Fig.

*Inhabits* the East.

This is the insect which is said to fructify the female Fig-tree. When the male fig is in blow, the male insect, covered with the farina of the flowers, flies off, and penetrates into the flowers of the female fig in search of its own female, and thus impregnates the tree.

## GEN. LXXXI. TENTHREDO. Mouth with a hor-

ny, arched mandible, dentated within; a straight maxilla obtuse at the apex; the lip cylindrical and trifid; palpi four, unequal, and filiform. Wings plane and tumid. The sting with two serrated laminæ, almost hidden. Scutellum bearing two small tubercles at some distance from each other.

The larvæ of the insects of this genus have from sixteen to twenty-eight feet; a round head, and on each side an eye; when they are touched, they roll themselves together. They feed on the leaves of plants. When full grown, they make, sometimes in the earth, and sometimes between the leaves of the plant on which they feed, a net-work case, and within it change to a pupa *incompleta*, which, for the most part, remains during the winter in the earth. The perfect insects vary in colour in the different sexes, and hence, the knowledge of the species is but imperfect. When frightened, they bend down their antennæ.

\* *With clavated antennæ.*

1. *Tenthredo femorata*. Antennæ yellow; body black, the hind thighs very large.

*Inhabits* Europe. B.

The

## TENTHREDO.

The larva is green, with a blue line upon the back ; and a yellow one on the sides ; it feeds on the alder and willow.

2. *Tenthredo lutea*. Antennæ yellow ; the segments of the abdomen in general, bright yellow.

*Inhabits* Europe. B.

A rare insect ; the larva is smooth and green, with a black line on the back ; it feeds on the willow, alder, and birch. The fly is found in June.

3. *Tenthredo Vitellina*. Abdomen black above, red on the sides ; the thighs dentated behind.

*Inhabits* Europe. B.

The larva is greenish ; it squirts water from an aperture placed before the anus, as from a siphon ; it feeds on the birch and willow ; the antennæ are yellow, black at the tips.

**\*\*** *Antennæ not articulated, thick at the tips.*

4. *Tenthredo cyanocrocea*. Head and thorax blue, abdomen red.

*Inhabits* England.

Found on umbelliferous plants : antennæ black, feet many coloured.

5. *Tenthredo atrata*. Black, the back with a band, and three arches yellowish green.

*Inhabits* England.

Wings ferruginous, the joints, tibiæ, and under part of the tarfi yellow, the claws red.

**\*\*\*** *Antennæ pectinated.*

6. *Tenthredo dorsata*. Whitish ; head, and back of the thorax, and abdomen black.

*Inhabits* England.

The antennæ are black.

**\*\*\*** *Antennæ pinnated.*

7. *Tenthredo Pini*. Antennæ lanceolated ; the thorax somewhat villous.

*Inhabits* Europe. B.

Found on Pine trees ; the male is black, with orange tibiæ, and femora ; the female is double the size, grey, with  
ferrated

## TENTHREDO.

serrated antennæ. The larva is blue, but orange coloured at both extremities.

\*\*\*\*\* *With filiform antennæ, and from seven to nine articulations.*

8. *Tenthredo arcuata*. Abdomen black; with five arches, a fascia at the base, and the sides greenish yellow.

*Inhabits* England.

Antennæ black, yellow at the base; the lip and a line upon the thorax, which is black, yellow; yellow spots on the breast, and the scutellum of the same colour. Wings transparent, the costa brown.

9. *Tenthredo rustica*. Black; the abdomen with three yellow bands, the two last interrupted.

*Inhabits* Europe. B.

Found on the Honeyfuckle; mouth whitish, a yellow spot on the thorax, scutellum, and shoulders; feet bright yellow, the last joints black. The larva is cinereous, with triangular brown spots on the back.

10. *Tenthredo Scrophulariæ*. Antennæ yellow, the abdomen with five light yellow bands, the first at some distance from the rest.

*Inhabits* Europe. B.

Found on the water betony; the hind thighs of the male marked with a yellow line underneath. The larva has 22 feet, white, with black dots.

11. *Tenthredo Salicis*. The body variegated.

*Inhabits* Europe. B.

Found on the willow and poplar. The larvæ feed in parallel rows; they are plain, rough, and yellow, with two lines of black dots on each side; the head black.

12. *Tenthredo blanda*. Black, the abdomen red in the middle, the hind thighs with a white spot.

*Inhabits* England.

The antennæ have seven articulations.

13. *Tenthredo caerulefcens*. Of a violaceous colour; the abdomen yellow; the wings with a brown spot.

*Inhabits* England.

Found in woods; the antennæ have seven articulations.

14. Ten-

## TENTHREDO.

14. *Tenthredo Rosae*. Black, the abdomen yellow; the anterior margin of the upper wings black.

*Inhabits* Europe. B.

Found on the Rose; the thorax sometimes spotted with yellow; the larva yellow, with black dots.

15. *Tenthredo aethiops*. Smooth and black, the two first pair of tibiae pale.

*Inhabits* England.

A small species; the antennae with seven articulations.

16. *Tenthredo Capreae*. Yellow, the head, the upper part of the thorax and abdomen black; the wings marked with a yellow dot.

*Inhabits* Europe. B.

Found on willows and the currant. The larva will not touch the black currant, but feeds on the red currant and the gooseberry; it is blue, the three first segments, and the last orange, with nine rows of black spots.

\*\*\*\*\* *Antennae setaceous, with many articulations.*

17. *Tenthredo erythrocephala*. The body blue; the head red.

*Inhabits* Europe. B.

Found on the *Pinus sylvestris*; the male is black, the mouth, and first pair of tibiae yellow.

18. *Tenthredo Cynosbati*. Body black, with the segments of the abdomen white at the sides.

*Inhabits* Europe. B.

Found on the rose; among the smallest of the genus, and has the habit of an *Ichneumon*. Antennae black, with 18 articulations.

19. *Tenthredo nemorum*. The abdomen red in the middle, with a white scutellum, and dot on the wings.

*Inhabits* England.

Found in woods.

GEN. LXXXII. SIREX. Mouth with a thick, horny, mandible, truncated at the apex, and denticulated; an incurved, acuminate, cylindrical, ciliated maxilla, and a lip, both of them membranaceous and intire,

**SIREX.**

intire, the whole short. Palpi four, the hind ones the longest, thick towards the tips. Antennæ filiform, with more than 24 equal articulations. Sting exerted, stiff, and serrated. Abdomen sessile, terminating in a point or spine. Wings lanceolated, and not folded.

The larvæ of the insects of this genus have six feet; they are soft and cylindrical; with their head, which is rounded, they gnaw and perforate wood, and, like those of the Ichneumon, many of them live on other insects, particularly on the larvæ of the Lepidoptera. The pupa is inclosed in a case; it is inactive, and resembles the perfect insect, except in wanting wings.

1. *Sirex Gigas*. The abdomen yellow at the base and apex; the body black.

*Inhabits* Europe. B.

Found on the cone-bearing trees; the largest of the genus. The female pierces the wood of trees with her sting, and deposits her eggs in clusters of two or three hundred together: the larva lives in the body of the tree, enlarging its habitation as it encreases in size. When full grown, it is about an inch and a quarter in length, of an uniform pellucid yellowish colour, with a small spine at the end of the body. See Plate VII. fig. 16, 17, and 18.

2. *Sirex Spectrum*. Abdomen black, the thorax villous; a yellow stripe on each side placed before the wings.

*Inhabits* Europe. B.

Found in putrid wood, especially of the Fir and Pine tribe. It is active and vigorous, and cannot be taken without danger of its stinging. The sting is small, fine as a needle, and will pierce one's finger to the bone.

3. *Sirex tabida*. Black, the sides of the abdomen dotted with yellow; the tibiæ of the fore-legs testaceous.

*Inhabits* England.

Found on flowers.



**GEN. LXXXIII. ICHNEUMON.** Mouth with a straight, membranaceous, bifid maxilla, rounded at the apex, dilated, ciliated, and horny; an arched acute horny mandible, without teeth; a lip cylindrical, emarginated, horny, and membranaceous at the apex. Palpi four, unequal, filiform, in the middle of the lip. Antennæ setaceous, with more than 30 articulations. Sting exerted, inclosed in a cylindrical sheath composed of two valves.

The insects of this genus lay their eggs in the bodies of Caterpillars or Pupæ, which are there hatched; the larvæ have no feet, they are soft and cylindrical, and feed on the substance of the Caterpillar; this last continues to feed, and even to undergo its change into a chrysalis, but never turns to a perfect insect; when the larvæ of the ichneumon are full grown, they issue forth, spin themselves a silky web, and change to a pupa *incompleta*, and in a few days the fly appears. The genus is very numerous, containing upwards of 400 species; it is therefore divided into sections.

\* *With a whitish scutellum; and antennae with white rings.*

1. *Ichneumon raptorius*. Scutellum white; the thorax not spotted; the second, third, and fourth segments of the abdomen yellow; the rest white at the apex.

*Inhabits Europe. B.*

The thighs of the two last pair of legs are black.

2. *Ichneumon sarcitorius*. Scutellum whitish, thorax not spotted, the third segment of the abdomen behind, and the second segment ferruginous, the sixth yellow.

*Inhabits Europe. B.*

Head and thorax black; antennæ black, with yellow rings, the tips black.

3. *Ichneumon extensorius*. Scutellum yellowish, the thorax not spotted, the second and third segment of

## ICHNEUMON.

of the abdomen ferrugineous, the last ones whitish at the apex.

*Inhabits* Europe. B.

Antennæ black, with a white ring; head black; thorax black, yellow at the apex; feet yellow, thighs black.

4. *Ichneumon ambulatorius*. Scutellum yellowish; thorax spotted, the second segment of the abdomen ferrugineous, the rest white at the margin.

*Inhabits* England.

Head black, antennæ yellow, for more than half their length; thorax black, with a small yellow line on the forepart, and a yellow dot before the wings and scutellum.

5. *Ichneumon primatorius*. Black; scutellum yellowish, thorax spotted, the second and third segments of the abdomen ferrugineous, the last ones with white spots.

*Inhabits* England.

Like the *farcitorius*, but three times larger; wings transparent, the costa brown.

*Ichneumon xanthorius*. Black, scutellum yellow; antennæ with a yellow ring; thorax spotted; the abdomen with yellow rings and separated from the thorax by a sort of stalk, the feet yellow, the thighs black.

*Inhabits* England.

**\*\* Scutellum whitish; antennae wholly black.**

*Ichneumon dimicatorius*. Black, scutellum yellow; antennæ red underneath, thorax armed on both sides with a spine, the abdomen black, the anus and two bands yellow.

*Inhabits* England.

*Ichneumon luctatorius*. Scutellum white, thorax spotted, second and third segments of the abdomen dark yellow.

*Inhabits* Europe. B.

Head, thorax, and antennæ black, with a yellow spot on both sides before the eyes; thighs black, feet yellow.

*Ichneumon fasciatorius*. Scutellum white; thorax

## ICHNEUMON.

spotted; abdomen black; the third, the sixth, and the base of the second segment, yellow.

*Inhabits* England.

10. *Ichneumon annulatorius*. Scutellum yellowish; thorax spotted; the margins of the first four segments of the abdomen yellow; wings transparent.

*Inhabits* England.

11. *Ichneumon persuasorius*. Scutellum white; thorax spotted; each segment of the abdomen with two white dots on the sides.

*Inhabits* Europe. B.

12. *Ichneumon tinctorius*. Scutellum white; thorax not spotted; abdomen black, with a white fascia at the tail.

*Inhabits* England.

\*\*\* *Scutellum of the same colour with the thorax; antennæ with a ring.*

13. *Ichneumon comitator*. Wholly black.

*Inhabits* Europe. B.

The ring on the antennæ is white.

14. *Ichneumon peregrinator*. Black, feet somewhat clubbed and ferrugineous; the abdomen ferrugineous, the two last segments black; the extremity whitish.

*Inhabits* Europe. B.

15. *Ichneumon incubitor*. Black; the abdomen ferrugineous, the apex black, with a white spot; the wings transparent.

*Inhabits* Europe. B.

16. *Ichneumon obscurator*. Wholly black, the feet red; the under side of the tarsi of the hind feet white at the apex.

*Inhabits* England.

This species smells of Musc.

\*\*\*\* *Scutellum of the same colour with the thorax; antennæ black.*

17. *Ichneumon manifestator*. Black, and not spotted; the

## ICHNEUMON.

the abdomen sessile and cylindrical, the feet red.

*Inhabits* Europe. B.

18. *Ichneumon compunctor*. Black; the mouth and feet red; the abdomen attached to the thorax by a stalk.

*Inhabits* Europe. B.

A small species; found frequently in the chrysalids of Butterflies.

19. *Ichneumon elongator*. Black; the second, third, and fourth segments of the abdomen and feet red; the thighs of the hind pair of feet black.

*Inhabits* England.

20. *Ichneumon latrator*. Black, the second, third, and fourth segments of the abdomen, the mouth and feet red, the hinder ones black, with red rings.

*Inhabits* England.

21. *Ichneumon lineator*. Black, the abdomen supported on a stalk; the forehead with yellow lines, the fore feet ferrugineous.

*Inhabits* England.

22. *Ichneumon saltator*. Black; the abdomen clubbed and very short; the sting cylindrical; the hind feet long.

*Inhabits* England.

A small species.

23. *Ichneumon oculator*. Black, the base of the abdomen with a yellow dot on each side; the thorax bidentated behind.

*Inhabits* England.

24. *Ichneumon inculcator*. Black; the abdomen hooked and ferruginous.

*Inhabits* Europe. B.

25. *Ichneumon pugillator*. Thorax not spotted; abdomen falcated, red at the base, black at the apex; the feet slender and ferruginous.

*Inhabits* Europe. B.

This species lays its eggs in the Caterpillar of the *Phalæna ziczac*: it has a yellow spot on the forehead.

26. Ich-

## ICHNEUMON.

26. *Ichneumon rufipator*. Black; the abdomen something cylindrical; the feet ferruginous, the thighs clavated, the hind ones armed with a dent.

*Inhabits* Europe. B.

27. *Ichneumon jaculator*. Black; the abdomen falcated and red in the middle; the hinder tibiæ clavated at the base, white at the apex.

*Inhabits* Europe. B.

This species lays its eggs in the larvæ of bees and Spheges. Bergman says, that it examines with its antennæ where the Spheg is concealed in a hole of the wall, and having discovered him, it flies off, and then returns to inject into him its eggs.

\*\*\*\*\* *Antennæ yellow.*

28. *Ichneumon luteus*. Yellow; the thorax striated, the abdomen falcated.

*Inhabits* Europe. B.

This species lays its eggs in the bodies of Caterpillars, particularly of the Phalænæ.

29. *Ichneumon amictus*. Black, the abdomen falcated; the antennæ and feet ferruginous.

*Inhabits* England.

30. *Ichneumon ramidulus*. Yellow; the abdomen falcated, black at the apex.

*Inhabits* Europe. B.

31. *Ichneumon circumflexus*. Black, the abdomen falcated, yellow before; the joints of the hind feet black; the scutellum yellow.

*Inhabits* Europe. B.

32. *Ichneumon polyzonias*. Black; the head, thorax, and breast spotted with yellow; the scutellum yellow; the abdomen black, the margins of the segments yellow.

*Inhabits* England.

33. *Ichneumon chrysopus*. Thorax spotted; the margins of all the segments and the feet yellow.

*Inhabits* Europe. B.

Lays its eggs in the larvæ of the Phalæna Trifolii. From the Linnæan Transactions, Vol. III. p. 4.

\*\* *Small*

## ICHNEUMON.

\*\*\*\*\* *Small ; the abdomen ovate and sessile.*

34. *Ichneumon Bedeguaris*. Green and shining ; the abdomen gilded.

*Inhabits Europe. B.*

This species lays its eggs in the larvæ which inhabit the galls on the rose and oak ; its sting is as long as its body.

35. *Ichneumon puparum*. Of a bluish bronze colour, the abdomen green and shining, the feet pale.

*Inhabits Europe. B.*

This species lays its eggs in the larvæ of insects, particularly in those of the genus *Papilio* and *Musca* when they have newly cast their skin.

36. *Ichneumon ficalis*. Black ; the head red, the eyes green.

*Inhabits Europe. B.*

A very small species which lays its eggs in the larvæ that infest the spikes of Rye.

37. *Ichneumon inferens*. Black ; the antennæ capitated ; the abdomen lanceolated and shining.

*Inhabits England.*

This very small *Ichneumon* is the enemy of the *Tipula tritici*. During the day it hovers over the ears of wheat, and inserts its eggs in those of that insect.

38. *Ichneumon Tipulæ*. Black ; the antennæ at the base and the feet red ; the hind tibiæ clavated, and black at the apex ; the abdomen obovate.

*Inhabits England.*

Likewise an enemy to the *Tipula tritici*, in the larva of which insect it deposits a single egg.

39. *Ichneumon penetrans*. Of a brassy black colour ; the abdomen bluish black, and compressed ; the tail truncated, the aculeus sub-exserted.

*Inhabits England.*

The length is not so much as a line. Like the preceeding it frequents the ears of wheat, penetrating the glumes with its short aculeus to deposit its eggs.

40. *Ichneumon aphidum*. Black ; the base of the abdomen, the fore feet, and the joints of the hind feet yellow.

*Inhabits Europe. B.*

This species lives among the Aphides.

## ICHNEUMON.

41. *Ichneumon globatus*. Black, the feet ferruginous.

*Inhabits* Europe. B.

Found in the stalks of grasses, several lodging in one case which is silky, almost round and white.

42. *Ichneumon glomeratus*. Black, the feet yellow.

*Inhabits* Europe. B.

This species lays its eggs in the Caterpillars of Butterflies and sometimes in the chrysalids. When they are about to change each spins a yellow case in which they become pupae.

43. *Ichneumon pectinicornis*. Black, the antennae branched.

*Inhabits* Europe. B.

Found in the *larvae subcutaneæ* of the Oak.

44. *Ichneumon punctum*. Black and shining; wings iridescent, the margin fringed with long hairs.

*Inhabits* England.

Given from the Linnæan Transactions, Vol. IV. p. 18. It is so small as scarce to be perceived except when in motion.

GEN. LXXXIV. SPHEX. Mouth with an inferior maxilla; a horny, incurved, dentated, mandible; a horny lip, membranaceous at the apex. Feet with five palpi. Antennæ with seldom more than ten articulations. Wings plane and incumbent in both sexes. The sting concealed in the abdomen.

The insects of this genus are found chiefly on umbelliferous plants; the larva is soft, without feet, and lives in the bodies of dead insects in which the mother had deposited her egg. The pupa is like the perfect insect, except in wanting wings.

\* *Antennæ filiform; the abdomen petiolated.*

1. *Sphex fabulosa*. Black and rough, the petiolus of the abdomen with two articulations, the second and third segments ferruginous.

*Inhabits* Europe. B.

Of this insect, the following remarkable account is given by Ray. "On the 22d of June, says he, in the year 1686, I saw it dragging along a caterpillar three times larger than itself, which, after it had carried the length of fifteen

"

## SPHEX.

“ and upwards, it deposited near the entrance of a hole  
 “ which it had previously dug in the earth. It then removed  
 “ a little ball of earth, with which the entrance was covered,  
 “ and went in; after a short stay it came out again,  
 “ and seizing the caterpillar drew it into the hole and left  
 “ it there. Then taking some globules of earth, it shoved  
 “ them one after another into the hole, and now and then  
 “ scraping with its feet as rabbits or terriers do, it threw the  
 “ loose earth backwards into the hole, and continued to do  
 “ so with the globules of earth and dust alternately till the  
 “ hole was quite filled, descending at times, as I thought,  
 “ for the purpose of pressing down and consolidating the  
 “ earth, and once and again flying to a neighbouring fir tree,  
 “ perhaps, to procure turpentine to conglutinate the work.  
 “ When the hole was filled and the surface levelled, so that  
 “ the entrance could no longer be discerned, it took two  
 “ leaves of fir which were lying near, and placed them close  
 “ to the entrance, as if to mark the spot. Who, says the  
 “ pious observer, can contemplate such things without admiration  
 “ and astonishment; or attribute them to a mere machine!”  
 “ In this caterpillar the eggs had previously been laid,  
 “ and it was to serve for food to the young Spheges in their larva state.

2. *Sphex spirifex*. Black; the thorax rough and not spotted; the petiolus yellow with one articulation, the length of the abdomen.

*Inhabits Europe.* B.

Barbut received this species from Peterborough in Northamptonshire, where it had formed its cell in the mud wall of one of the cottages on the side of a hill, and which was wrought into the appearance of a honey-comb. The eggs are laid in the back part of the cell, where the animal lives, evenly arranged, and when the time of their being hatched is near, the fly brings in a number of slaughtered insects for food to the expected young. She then closes up the mouth of the hole with mud, and her care is over. When the young worms hatch, they find their food ready, and when they have eaten their fill, they rest and change into a fly.

\*\* *Antennæ filiform; the abdomen sessile.*

3. *Sphex viatica*. Downy and black; the wings brown; the abdomen ferrugineous before, with black wings.

*Inhabits Europe.* B.



## SPHEX.

One of the largest of the genus ; in manners it agrees with the *fabulosa*.

4. *Sphex fusca*. Smooth and black ; the abdomen ferrugineous at the base.

*Inhabits* Europe. B.

Like the last species ; but the thorax is smooth.

5. *Sphex xanthocephala*. Black, the forehead yellow, the abdomen and feet spotted with yellow.

*Inhabits* England.

The antennæ are as long as the thorax, yellow at the base, wings transparent, brownish at the apex : feet yellow, the joints black, the tarsi brown.

6. *Sphex spinosa*. Black ; the thorax behind furnished with a spine on each side ; the lip and breast filvery.

*Inhabits* England.

Smooth ; the wings transparent ; the feet red.

GEN. LXXXV. SCOLIA. Mouth with an arched and very acute horny mandible, crenated within ; the maxilla porrected, compressed, somewhat obtuse at the apex, intire and horny ; the tongue inflected, trifid, and very short ; the lip projecting, membranaceous at the apex and intire. Four equal, short, filiform palpi, in the middle of the lip. Antennæ thick, filiform ; the first articulation the longest.

The insects of this genus are all foreign.

*Scolia atrata*. Rough and black ; wings ferrugineous, black at the apex.

*Inhabits* America.

GEN. LXXXVI. THYNNUS. Mouth horny ; the mandible incurved ; the maxilla short and straight ; the lip longer than the maxilla, membranaceous at the apex and trifid ; the middle lacinia emarginated.

## LYNNUS.

nated. Tongue very short and involuted. Palpi four, filiform and equal. Antennæ filiform.

The insects of this genus are all natives of New Holland.

*lynnus dentatus*. The abdomen black; the second, third, and fourth segment marked with two white dots.

*Inhabits* New Holland.

XXXVII. LEUCOSPIS. Mouth horny, with short maxillæ; the mandible thick, with three teeth at the apex; the lip longer than the maxilla, membranaceous at the apex and emarginated. Palpi four, short, equal and filiform. Antennæ short, straight, and clavated. Thorax below furnished with a long, lanceolated scale; the sting reflexed upwards, and hid in a groove of the abdomen.

Of this genus there is no British species.

*leucospis dorfigera*. The scale of the thorax almost as long as the abdomen, which is sessile.

*Inhabits* Italy, Germany, and Switzerland.

XXXVIII. TIPHIA. Mouth with a membranaceous, rounded, horny maxilla; an arched, acute, horny mandible; the lip short and horny with three dents; no tongue. Palpi four, filiform, unequal, and projecting from the middle of the lip. Antennæ filiform and arched.

1. *Tiphia femorata*. Black; the four hind thighs angulated and red.

*Inhabits* England.

2. *Tiphia quinqueincta*. Black; thorax spotted: the abdomen

## TIPHIA.

abdomen with five yellow fasciæ ; the second interrupted.

*Inhabits* England.

**GEN. LXXXIX. CHALCIS.** Palpi, four, equal. Antennæ short, cylindrical, fusiform, the first articulation somewhat thick.

*Chalcis fipes.* Black : the petiolus of the abdomen, and hind thighs thick and yellow.

*Inhabits* Europe. B.

**GEN. XC. CHRYSIS.** Mouth horny and porrected ; the maxilla linear, much longer than the lip, which is emarginated, and both membranaceous at the apex ; no tongue. Palpi four, projecting, unequal, and filiform. Antennæ short, filiform, the first articulation the longest, the other eleven short. Body bronzed, shining, and smooth ; the abdomen arched underneath, with a lateral scale on each side ; the extremity, in most species, dentated : the sting somewhat exerted. Wings not folded.

The insects of this genus lay their eggs in the holes of walls.

1. *Chrysis ignita.* Smooth and shining ; thorax green : abdomen gilded ; with four dents at the apex.

*Inhabits* Europe. B.

Not uncommon. It resides in the chinks of old walls or decayed trees, near the entrance of woods. It rarely appears until the middle of the day, and then only when the sun shines.

2. *Chrysis bidentata.* Smooth, blue and shining ; thorax bidentated, the two first segments of the abdomen gold-coloured.

*Inhabits* Europe. B.

A small but very beautiful insect ; three very short dents at the extremity of the abdomen.

3. *Chrysis*

## HRYSIS.

- *Chrysis aurata*. Smooth and shining; thorax green; the abdomen gold-coloured; the extremity with two dents.

*Inhabits Europe.* B.

- *Chrysis cyanea*. Smooth and shining: the thorax and abdomen blue, the extremity with three dents.

*Inhabits Europe.* B.

GEN. XCI. VESPA. Wasp. Mouth horny, maxilla compressed: palpi four, unequal, and filiform. Antennæ filiform, the first articulation the longest, and cylindrical. Eyes shaped like a crescent. Body smooth; the sting hid within the abdomen; the upper wings folded in both sexes.

The insects of this genus live in society; they prey on insects that have naked wings, particularly bees and flies: the larva is soft and wants feet; the pupa is motionless, and like the perfect insect, except in wanting the wings. Wasps make a hive of a substance like paper formed of wood reduced to a paste; the combs are horizontal, and have only one row of hexagonal cells, flat at bottom, the mouth turned downwards, which serve only for holding the young. Every hive is begun by a mother, who at first deposits a few eggs, from which neuters are produced, or working wasps, who assist her in increasing her work and in feeding the young afterwards produced. Neither males nor females are produced till towards the month of September. Before that time there are none in the nest but the female and the neuters she had engendered. The females remain in the nest. The males do no work. Wasps feed their larvæ with insects, meat, and the fragments of fruits. Towards autumn, they kill such of the larvæ and pupæ as cannot come to perfection before the month of November. The males and neuters perish of themselves during winter, and none remain but some females to perpetuate the species.

\* *Antennæ thickest at the extremity.*

1. *Vespa Crabro*. The Hornet. The thorax black; red before, without spots; the incisures of the abdomen with a double contiguous black dot.

*Inhabits Europe.* B.

This

## APIS.

\* *The tongue quinqued ; the palpi short.*

1. *Apis longicornis*. The antennæ of the length of the body, which is tawny, and covered with hair.

*Inhabits Europe. B.*

Found on flowers ; the tongue at the apex is divided into seven.

2. *Apis tumulorum*. The antennæ as long as the body, and black ; the feet and maxilla yellowish.

*Inhabits Europe. B.*

Found on flowers. Not common, but chiefly remarkable for the length of the antennæ.

3. *Apis centuncularis*. Black ; the belly covered with tawny down.

*Inhabits Europe. B.*

This species makes its nest in the earth, and even in the solid timber of growing trees ; it forms cylindrical cavities, lined in the inside with rose leaves, applied to the apartments in a very curious manner. The parent Bee flies to the orifice of the perforation with a leaf, where she clips it round to the size of the hole ; this is forced to the bottom of the lowest cell ; about 7, 8, or 10 of such pieces form the first layer ; the next forms the sides or cylindrical part of the lining ; this is done by laying several whole leaves, partly over each other, and cementing them together with a glutinous substance ; thus the sides and bottom, each consisting of several layers, being finished, (in the form of a thimble) the Bee partly fills it with a kind of paste, then throws over it a small quantity of leaves, reduced to powder, and deposits the egg ; the covering to the whole is formed of the same materials, and in the same manner as the bottom ; when she has forced about ten or fifteen circular pieces of leaves into the avenue, and cemented them to the top, the covering is finished, and the egg is completely secured from accident. In this manner she proceeds, and finishes every cell distinctly, till the perforation is intirely filled : in some trees, 40 or 50 such perforations are placed within a quarter of an inch of each other. The Bee comes forth in August. Donovan.

4. *Apis punctata*. Black, and covered with a cinereous down ; the abdomen black ; the segments marked on each side with a white dot ; the scutellum entire.

*Inhabits Europe. B.*

The

## APIS.

The abdomen is smooth and shining; the first and second segment have a small fasciculus of white hairs on each side, the third, fourth, and fifth a white dot, the last none.

5. *Apis rufa*. Brown, the abdomen reddish; the forehead white.

*Inhabits* Europe. B.

Found on flowers; the antennæ black, shorter than the body.

6. *Apis mellifica*. Common Hive Bee. Downy, thorax somewhat grey, the abdomen brown; the hinder tibiae ciliated and transversely striated on the inside.

*Inhabits* Europe. B.

This insect, whose use to mankind is so important, whose history is so remarkable, and whose manners are so curious, deserves particular notice. A hive generally contains from 16 to 20,000 Bees, of which one only is a female, about 1,500 are males or drones, the rest are neuters or working Bees. Upon these last depend the various labours of fabricating the combs, making the honey, and feeding the young. Some of them, particularly the younger ones, go abroad to collect the pollen of flowers, which they do sometimes at the distance of miles, and bring it home to the hive, where the older ones receive it from them, and with it feed the maggots. They likewise suck the nectar of flowers, a sweet juice residing in a particular receptacle, and which probably all flowers are possessed of; this they elaborate into honey by a peculiar organ, and discharge upon returning to the hive. They feed the larvæ, keep the hive clean, and carry out any dead bees. They are provided with an acrid poison and a sting, which they use as weapons of defence, but which they can only use once in their lives, for when they exert their sting they cannot withdraw it, on account of its serrated edges, but leave it in the wound, along with a part of their bowels, so that they generally fall a sacrifice to their resentment. A single swarm of Bees has been known to sting two horses to death. The drones are mere idlers, and have no other business in the hive than to impregnate the female, and this, it is said, contrary to the general rule of nature, they must be courted and excited by her to do. Many die as soon as this necessary business is performed; the rest are, some months afterwards, teased, not stung, to death by the neuters. The female now deposits her eggs in cells destined

## APIS.

for their reception ; those that are to produce drones in cells larger than the rest. When this progeny, which generally consists of about 6 or 7000, has arrived at the state of perfect insects, they separate themselves from the parent colony, and swarm. If there are more females than one in this swarm, they fight with one another, and the victorious party is acknowledged by the swarm as Queen. The cells, which are hexangular, and about six lines deep, are made of wax, and serve in the first place as the residence of the maggot, and then as a receptacle for the honey. The comb consists of two rows of cells, whose bases form the partition between the two rows ; they are placed nearly horizontally, the mouth being raised a little, probably to retain the honey. The larva is hatched in about five days after the egg is deposited in the cell, and in seventeen days more it becomes a perfect insect. Bees extract honey from most plants, but there are some of which they are peculiarly fond ; such as, the *Echium*, *Borago*, *Verbascum*, *Serpyllum*, and the plants of the class *Tetradynamia* : they are also fond of the *Rhus glabrum* and *Aselepias syriaca*, on which they sit without humming. In particular countries they attach themselves to particular plants ; for instance, in Sweden and the Highlands of Scotland, to the *Erica* ; in Scania, to the Buckwheat ; in Poland, to the Limetree ; in Narbonne, to the Rosemary ; in Greece, to the Thyme ; in Corsica, to the *Arbutus* ; in Sardinia, to the *Absointhium* ; in Pontus, to the *Aconitum*, &c. and hence arise the different flavour and quality of honey. Bees in the hive generate a considerable quantity of heat, sometimes equal to that of a fowl in the act of incubation, though a single Bee possesses no more warmth than other cold-blooded animals. The eggs require heat, and neither maggot nor pupa will live in a heat under 60° or even 70°.

7. *Apis pilipes*. Grey ; the middle pair of feet with tufts of hair.

*Inhabits* England.

The whole body is covered with hair of a cinereous colour. The feet are black, the four hind pair, particularly the middle ones, are rough, with long tufts.

8. *Apis manicata*. Cinereous, the abdomen black, with yellow spots on the sides, the tail with five dents.

*Inhabits* Europe. B.

Builds

## APIS.

Builds in hollow trees: the first pair of feet shaggy.  
Found on flowers.

9. *Apis conica*. Brown, the abdomen conical and very acute; the margins of the segments white; the scutellum without spines.

*Inhabits* Europe. B.

Found on flowers; it builds in mud walls.

10. *Apis annulata*. Black, the forehead, and rings on the feet white.

*Inhabits* Europe. B.

Found on flowers. It is small and smells of musc.

11. *Apis terrestris*. The humble Bee. Black and hairy; the thorax with a yellow belt; the tail white.

*Inhabits* Europe. B.

This species builds deep in the earth, and comes abroad in fine weather in summer, and even early in spring, making honey with great assiduity.

12. *Apis nemorum*. Hairy and black; the thorax with a yellow interrupted fascia, the tail whitish.

*Inhabits* Europe. B.

This species is of the same size with the *terrestris*; the abdomen is black, except at the extremity.

13. *Apis lapidaria*. Hairy and black, the tail tawny.

*Inhabits* Europe. B.

Builds in heaps of stones; and makes honey with great industry.

14. *Apis muscorum*. Hairy, and of a tawny colour; the abdomen yellow.

*Inhabits* Europe. B.

Builds under mosses; and makes honey. The maggots are smooth, and of a light carnation colour. When they have attained their full size, they form strong cases like leather, in which they pass to the pupa state, and when they become perfect insects, these cases are filled with honey.

15. *Apis hypnorum*. Hairy, and of a tawny colour; on the abdomen a black fascia; the tail white.

*Inhabits* Europe. B.

Builds



## APIS.

Builds under mosses ; and lives in a hive, containing from 40 to 50 individuals. The three sorts differ more from one another in shape, than those of the common Bee, and they all work. There are several females and individuals of each sex, of two different sizes. Their nest is hid among grass and covered with moss, lined within with unwrought wax. It contains one or more combs, composed of oval bodies placed longitudinally against one another, and which are merely the cells out of which the bees have been bred. They are intermixed with irregular masses of farina, agglutinated together with a honey substance, which contain the eggs and larvæ, and which serve them at once for food and habitation. In different places there are waxen vessels filled with excellent honey. Towards winter, the Bees are all dispersed and perish, except a few females, which take refuge in holes, and perpetuate the species.

16. *Apis acervorum*. Hairy and black, the hinder tibiae ferruginous.

*Inhabits* Europe. B.

Builds in the ground.

17. *Apis subterranea*. Hairy and black, the tail brown. Found on flowers. Builds in the ground.

18. *Apis albifrons*. Pubescent, the forehead, thorax and tibiae white, with white dots on the abdomen.

*Inhabits* England.

The forehead truncated, antennæ pretty thick ; the wings pellucid and brown, with black veins.

\*\* *Tongue trifid*.

19. *Apis gibba*. Black, the abdomen red, black at the extremity.

*Inhabits* England.

GEN. XCIII. FORMICA. Ant. Palpi four, unequal, with cylindrical articulations, seated on a submembranaceous cylindrical lip. Antennæ filiform ; between the thorax and abdomen, a small erect scale. The sting concealed in the abdomen.

## FORMICA.

and possessed only by the females and neuters. The males and females only have wings.

All the species of this genus are of three sorts, males, females, and neuters. The males do not enter the nest, but content themselves with fluttering round the Ant-hill, where the females come out to seek them. The neuters alone labour; they form the Ant-hill, bring in the provisions, feed the young, bring them to the air during the day, carry them back at night, defend them against attacks, &c. The females are retained merely for laying eggs, and, as soon as that is accomplished, they are unmercifully discarded. The males and females perish with the first cold; the neuters lie torpid in their nest.

In the economy of the Ant, there are many things very remarkable; the insect is not so useful as the Bee, nor are its manners so wonderful, as its nest does not betray so much art; but by the diligent observer, the indefatigable industry of this little people; the zeal with which they gather provisions and wax, and particularly the exemplary tenderness they display towards their young in the pupa state (generally, though erroneously considered as their eggs), cannot be viewed without admiration. It has been observed, that a labouring Ant, whose abdomen had been wantonly cut off, has placed ten of its young in security, before it yielded to its painful death. Our northern species lie torpid in winter, so that they have no occasion for provisions, and accordingly they lay up none. But those of the torrid zone, which are not thrown into torpidity by cold, must act otherwise, else, in the rainy season particularly, they would starve. Ants furnish a peculiar acid; they live on garbage, on sweet liquors and fruits; they abhor fish; the larva is soft, white, and without feet; the pupa is motionless, and the favourite food of Nightingales and other Motacillæ. The genus is numerous, many of them natives of India and South America, where they often prove a great calamity.

1. *Formica herculanæ*. The Horse-Ant. Black; the abdomen ovate, the feet ferruginous.

*Inhabits Europe.* B.

This species is much larger than the common Ant: the head is blackish, with three dots on the hind part; the thorax ferruginous, growing black in the middle; the abdomen brown, consisting of five segments.

2. *Formica*

## FORMICA.

2. *Formica rufa*. The Pismire. Black; the thorax compressed, and the feet ferruginous.

*Inhabits* Europe. B.

The abdomen of the male has six segments, that of the female four.

3. *Formica fusca*. Common Ant. Black; the mouth, the apex of the thorax, and feet, ferruginous.

*Inhabits* Europe. B.

The body with minute cinereous down, whence, when held in a certain light, it appears black, in another grey; the lowest articulation of the antennæ is longest and red.

4. *Formica rubra*. Red Ant. Of a testaceous colour, the eyes, and a dot under the abdomen, black.

*Inhabits* Europe. B.

This harbours in woods below stones, and bites severely.

5. *Formica omnivora*. The thorax with elevated dots, the petiolus with two knobs, the body testaceous, the abdomen very small.

*Inhabits* South America, and the neighbouring islands.

This is a most destructive insect, devouring and destroying all sorts of provisions.

GEN. XCIV. MUTILLA. Mouth horny, no tongue, the maxilla membranaceous at the apex, the lip projecting, obconical, bearing on its apex four unequal palpi with obconical articulations. Antennæ filiform. In general no wings. Body pubescent. Thorax behind hollowed. The sting concealed.

The insects of this genus are mostly foreign, only a few being natives of Europe.

*Mutilla europæa*. Black; the thorax red, the segments of the abdomen white on the margin.

*Inhabits* Europe. B.

The female of this species is winged.

## § 261.

## ORDER VI. DIPTERA. †

THIS Order includes all those insects that have but two wings, and behind, or below them, two globular bodies, supported on slender pedicles called *Halteres*, or *poisers*. At the mouth they have a proboscis, sometimes contained in a vagina, and sometimes furnished at its sides with two palpi, but no maxillæ. Their eyes are reticulated and large. The females, in general, lay eggs, but some are viviparous; and the Hippobosca brings forth such as have already gone into the pupa state. The larvæ of the insects of this Order are as various in their appearance as the places in which they are bred. In general they do not cast their skins, but change into a pupa *coarctata*.

**GEN. XCV. OESTRUS.** The Gad-fly. Haustellum retracted within the lips, which are tumid and grown together, with a small pore and no palpi. The vagina is membranaceous, cylindrical, obtuse, including three membranaceous setæ, which are flexible, short, and reflected. Antennæ short and setaceous.

The insects of this genus lay their eggs in the nostrils, or in the skins, of horses, oxen, rein-deer, goats, and sheep; there the larva is bred, and feeds on the fat of these animals, or on the matter which is generated in the wound. It is soft and without feet; in some species it has at the extremity two hooks which it uses to assist it in walking. These hooks are wanting in the larvæ, which reside in the skins of oxen and rein-deer. When full fed the larvæ let themselves fall on the ground, they enter the earth and change into an oval hard pupa. The perfect insect takes no food.

## 1. Oestrus

† From δύο, two, and πτερόν, a wing.

## OESTRUS.

1. *Oestrus Bovis*. The Breeze. Wings not spotted brown; the abdomen with a black fascia in middle, and tawny yellow hairs at the apex.

*Inhabits Europe.* B.

The larvæ, called Wornils in England, live in the back of oxen and other cattle, causing subcutaneous tubercle knots; they grow to be as large as the end of one's finger and may be squeezed out at a hole they have always of their own making. They are round and rough, and of a dirty white colour; they remain in the cattle all winter, and come out in July. Pliny says the Romans called the insect *Asilus*, the Greek *Oestrus*; and represents the herds as flying from the worm being instinctively terrified at the sound of its approach.

2. *Oestrus Equi*. Wings whitish, with a black fascia in the middle, and two black dots.

*Inhabits Europe.* B.

This is a dangerous and often fatal animal to horses. The female, it is said, watches the time when the horse discharges his excrement, and deposits her eggs at the extremity of the rectum. The young larva then makes its way through the gut of the horse (which is eighty-four feet long,) into the stomach; and upon dissection hundreds have been found there sticking fast to the inner coat by their hooks: sometimes they penetrate through the stomach, and gangrene ensues. In general, when their time of change arrives they creep back, through the long dark way by which they entered, drop upon the ground, and entering the earth form into a pupa. This is the common opinion; but it has been with more probability asserted, that the female lays her eggs among the hairs on some part of the horse accessible to the tongue, which, occasioning an itching, are by him licked and thus get into the stomach.

3. *Oestrus hæmorrhoidalis*. Wings not spotted, and brownish; the abdomen black, white at the base, and tawny at the apex.

*Inhabits Europe.* B.

Only half the size of the preceding species. The larva likewise makes its way into the stomach of the horse, by a similar mode to that of the *Equi*, only smaller and whiter. It may both be taken from the beginning of June to the end of July, being then found hanging to the extremity of the rectum of horses. When they fall to the ground they

## OESTRUS.

to a pupa in two days, and in about two months the fly appears.

4. *Oestrus nasalis*. Wings not spotted, thorax ferruginous, abdomen black with yellow hairs.

*Inhabits* Europe. B.

Linnæus says the larvæ are found in the fauces of horses, asses, mules, stags, and goats, entering by the nostrils. It is probable, however, that this is a mistake, and that they too inhabit the stomach. When the larva falls, it gets below horse dung where it changes to a pupa.

5. *Oestrus Ovis*. Wings pellucid, and somewhat dotted; the abdomen variegated with black and white.

*Inhabits* Europe. B.

This species gets into the frontal sinus of sheep: it is less than the preceding; the eyes are ferrugineous, the wings veined, the abdomen ovate, the crown of the head excavated and dotted. When the larva is full grown it falls through the nostrils, and changes to a pupa lying on the earth, or adhering by the side to a blade of grass: in two months the fly appears. All these insects are very troublesome to the animals they attack, and often occasion their death.

GEN. XCVI. TIPULA. Mouth furnished with a very short proboscis, membranaceous, grooved on the back, and receiving a bristle; a short haustellum without a vagina; two incurved palpi, equal, filiform, and longer than the head. Antennæ in most of the species, filiform.

The insects of this genus live on garbage; the larvæ have no feet, they are cylindrical and soft; they gnaw the roots of plants under which they live; they are preyed upon by crows; the pupæ are motionless, and cylindrical, with two horns before, dentated behind. Some species live in water, and either swim or roll themselves up in a case. The genus is divided into two sections. 1. Those whose wings, when at rest, are spread out from the body. 2. Those whose wings are incumbent, or lie along the abdomen, resembling the insects of the genus *Culex*.

## TIPULA.

\*\* *With incumbent wings.* Culiciformes.

15. *Tipula plumosa*. Thorax greenish; wings white, with a brown dot; the antennæ feathered.  
*Inhabits* Europe. B.  
 Found in April near marshes, and is so like the gnat that it is frequently taken for it.
16. *Tipula littoralis*. Greenish; wings not spotted, the fore legs the longest.  
*Inhabits* Europe. B.  
 Found in the neighbourhood of the sea coast.
17. *Tipula motitatrix*. The fore legs longest, and constantly moving, with a white ring.  
*Inhabits* Europe. B.  
 A frequent species, of a yellowish green colour.
18. *Tipula monilis*. The feet white, with nine black rings; wings variegated with black and white.  
*Inhabits* Europe. B.  
 Frequents gardens; easily known from the rest by the annuli on its legs. Common in August.
19. *Tipula zonata*. Pale; wings with two fasciæ, and three dots, brown; the thighs with a brown ring.  
*Inhabits* England.  
 Found at Oxford. The abdomen is pale, with three striz on the back, made up of brown dots.
20. *Tipula pusilla*. Green; with three black spots on the thorax; the antennæ of the male feathered.  
*Inhabits* Europe. B.  
 Found by the sides of ditches; hovers in the air in crowds. Common in August. Very small.
21. *Tipula Marci*. Black and smooth; wings blackish, the thighs of the first pair of legs fulcated on the inside.  
*Inhabits* Europe. B.  
 Found early in spring upon dunghills and moist ground; the antennæ are rather shorter than the head, incurved, resembling the horns of a cow.
22. *Tipula Pomona*. Black and smooth; wings transparent, with a black dot; the thighs ferruginous.  
*Inhabits* England.  
 Found on the flowers of fruit trees. It is very rare.
23. *Tipula*

**TIPULA.**

*Tipula variegata.* Black; the base of the abdomen and sides red, with yellow spots.

*Inhabits* Europe. B.

*Tipula contaminata.* Black; the wings white, with two fasciæ, and a dot, black.

*Inhabits* Europe. B.

Found in moist places.

*Tipula lunata.* Wings somewhat cinereous, with a white crescent at the margin.

*Inhabits* Europe. B.

Found in meadows.

1. *Tipula pratensis.* Thorax variegated; the abdomen brown; the sides spotted with yellow; the forehead tawny.

*Inhabits* Europe. B.

The larva is found in meadows, destroying the roots of grasses.

1. *Tipula cornicina.* Wings transparent, with a brown dot on the margin; the abdomen yellow, with three brown lines.

*Inhabits* Europe. B.

Feeds on the roots of plants.

2. *Tipula bimaculata.* Wings transparent, with two brown spots; in the middle of the abdomen a ferrugineous spot; the antennæ feathered.

*Inhabits* Europe. B.

The abdomen of the male wants the spot.

3. *Tipula regelationis.* Wings transparent and shining, the body of a cinereous brown colour.

*Inhabits* Europe. B.

This species is frequent early in spring, hovering in the air in fair weather in considerable numbers.

4. *Tipula punctata.* Wings transparent, with black dots; the exterior margin with black spots.

*Inhabits* Europe. B.

Found in the neighbourhood of Edinburgh, in June, hovering over drains.



## TIPULA.

30. *Tipula palustris*. Pale, the head black; the abdomen reddish.

*Inhabits* Europe. B.

Found in marshy places.

31. *Tipula minutissima*. Yellow, the eyes and crown of the head black.

*Inhabits* Europe. B.

The antennæ are shorter than the body.

32. *Tipula tritici*. Of a tawny red colour: wings whitish and iridescent, hairy on the margins; the eyes black.

*Inhabits* England.

From Mr. Kirby's Paper in the Linnean Transactions, Vol. V. Very small, about a line in length. The larva leaps, wants feet, is lemon-coloured, and marginated, the margin folded with papillæ; the head acute, the tail truncated. The pupa is narrow, acute at both ends, and reddish. Infests the ears of wheat, residing in the florets at the base of the corolla, and feeding on the pollen, by which the germination of the seed is prevented.

GEN. XCVII. DIOPSIS. Head with two filiform horns, not articulated, much longer than the head, and bearing the eyes in the apex.

*Diopsis ichneumonea*.

This is the only species of the genus. It is a South American insect, and was sent among a collection of insects to Linnaeus, by Dr. Fothergill. It resembles an ichneumon, but the two horns, with a knob at the end, make it very remarkable.

GEN. XCVIII. MUSCA. Mouth with a fleshy exerted proboscis, two equal lips and a haustellum furnished with setæ, and two short palpi. The antennæ in most species short.

As this genus contains a great number of species, it has been subdivided as follows.

\* *Having*

MUSCA.

- \* *Having a haustellum with an univalve vagina, the antennæ acuminate and united at the base.*  
Bibio, Fabr,

- \*\* *Having a haustellum without a vagina.*

A. With one seta.

- a. Antennæ acuminate, and united at the base.  
*Sirionomyia*, Fabr,

b. Antennæ short and clavate.

- a. Hairy, the antennæ feathered. *Pilosæ plumatæ*. *Musca* Fabr.

- b. Hairy, the antennæ furnished with a simple seta. *Pilosæ setaria*.

B. With three setæ. *Rhagio* Fabr.

C. With four setæ. *Syrphus* Fabr,

- a. Downy : the seta of the antennæ feathered, *Tomentosæ plumatæ*.

- b. Downy : the seta and antennæ naked. *Tomentosæ setaria*.

The insects of this genus in general live on filth ; their larvae want feet, they are annulated, nearly cylindrical, and attenuated behind : they are aquatic, and live on aquatic insects ; some live on filth, on dung and carcases, and some on small animals ; some chiefly on Aphides. The pupa is motionless, in many covered with a hard skin.

- \* *Hauſtellum with an univalve vagina ; antennæ pointed and united at the baſe.*

1. *Musca plebeia*. Cinereous and rough, the abdomen conical, the margin of the ſegments white.

*Inhabits* Europe. B.

Middle ſized ; the wings and tibiæ ſomewhat teſtaceous.

2. *Musca marginata*. Black, the abdomen conical, the ſegments white on the margin, the wings ſpotted.

*Inhabits* Europe. B.

3. *Musca*

## MUSCA.

3. *Musca Morio*. Rough and deep black ; wings black, transparent at the tips.

*Inhabits Europe.* B.

There are sometimes two or four white dots on the margins of the segments.

4. *Musca Maura*. Rough, deep black, fasciated with white ; wings black, the inner margin transparent and sinuated.

*Inhabits Europe.* B.

\*\* *Haustellum without a vagina.* A. a.

5. *Musca Chamaeleon*. The scutellum yellow, with two dents ; the abdomen black, with yellow fasciæ on the sides.

*Inhabits Europe.* B.

Found on flowers ; the female deposits her eggs in the hollow stalks of aquatic plants ; the larva appears about the beginning of June, and may be found in shallow standing waters, crawling on the grass or plants which grow there, or floating on the surface. It supports itself in the water, by expanding the hairs at its tail like rays from a centre. About the middle of July the fly appears ; it is often seen walking on the surface of the water.

6. *Musca Hydroleon*. Scutellum black, with two dents ; the abdomen green, black in the middle and angulated.

*Inhabits Europe.* B.

7. *Musca trilineata*. Scutellum with two dents ; body green, the thorax with black lines, and the abdomen with black fasciæ.

*Inhabits Europe.* B.

8. *Musca Hypoleon*. Scutellum yellow, with two dents ; body variegated with black and yellow.

*Inhabits Europe.* B.

9. *Musca sexdentata*. Scutellum with six dents ; thorax bronzed, the abdomen black.

*Inhabits England.*

10. *Musca marginella*. Black, the scutellum without dents ;

MUSCA.

dents; the margin of the abdomen and the tibiae whitish.

*Inhabits* England.

11. *Musca chalybeata*. Scutellum with six dents; the thorax shining like steel, the abdomen black.

*Inhabits* England.

Appears in the spring; the wings and poisers black; the feet testaceous; the ends of the tarsi black, dilated and clavated.

12. *Musca vallata*. Scutellum with six dents, the abdomen and thighs yellow.

*Inhabits* England.

Found among hedges; wings somewhat ferruginous, incumbent and plane, with a brown dot in the middle of the exterior margin; the poisers yellow, the tibiae towards the apex and the tarsi brown.

13. *Musca similis*. Scutellum with six dents, bluish green, and shining; the abdomen like steel.

*Inhabits* England.

Appears about midsummer; wings somewhat ferruginous, with a brown dot; the feet black; the poisers white.

A. b. a. *Pilosa plumata*.

14. *Musca inanis*. Brown; the abdomen pellucid; with three black bands.

*Inhabits* Europe. B.

Found in woods.

15. *Musca pellucens*. Black; the first segment of the abdomen white and pellucid.

*Inhabits* Europe. B.

Found in shady places.

16. *Musca meridiana*. Black, the forehead gilded; the wings ferruginous at the base.

*Inhabits* Europe. B.

Found in woods.

17. *Musca Casar*. Of a shining green colour; the feet black.

*Inhabits* Europe. B.

The larva is bred in carcases.

## MUSCA.

18. *Musca cadaverina*. Shining, the thorax blue, the abdomen green.

*Inhabits* Europe. B.

19. *Musca vomitoria*. Thorax black; the abdomen blue and shining, the forehead orange.

*Inhabits* Europe. B.

This is the common flesh fly. The larvæ of three of them will devour the carcase of a horse as soon as a lion.

20. *Musca carnaria*. Black, the thorax with three pale lines, the abdomen tessellated and shining.

*Inhabits* Europe and America. B.

The larva is bred in carcases; sometimes enters bee-hives; it appears, in warm weather, an hour or two after the egg is deposited.

21. *Musca domestica*. Lines upon the thorax; the abdomen tessellated, pale at the base underneath.

*Inhabits* Europe and America. B.

This is the common house-fly; the larva is bred in horse-dung; the pupæ lie parallel to one another.

22. *Musca canina*. Cinereous; the thorax with black dots; the abdomen with black streaks.

*Inhabits* Europe. B.

Middle sized; the thorax with four dots: the feet testaceous.

23. *Musca argentata*. Cinereous, the thorax with four lines; the abdomen of a changeable cinereous colour; the forehead silvery.

*Inhabits* Europe. B.

24. *Musca melanopyrrha*. Tomentose and black; the abdomen red at the apex.

*Inhabits* England and Germany. B.

The forehead of this species is pale, the eyes are black, the scutellum olive, the wings have orange nerves at the base, a large brown spot in the middle.

A. b. b. *Pilefæ fetaria*.

25. *Musca fera*. Black; the sides of the abdomen testaceous and transparent.

*Inhabits* Europe. B.

26. *Musca*

## MUSCA.

26. *Musca grossa*. Hairy and black; the wings ferruginous at the base.

*Inhabits* Europe. B.

Like the *meridiana*, but larger, being the largest of the genus. The larva is bred in cow-dung.

27. *Musca rotundata*. Thorax somewhat lined, the abdomen nearly round and ferrugineous, with a longitudinal line of black dots.

*Inhabits* Europe. B.

28. *Musca tremula*. Hairy, black, and shining, the base of the wings, the scale and the poisers ferrugineous.

*Inhabits* Europe. B.

Rather less than the house-fly, more oblong; the abdomen shining.

29. *Musca larvarum*. Blackish; the apex of the scutellum somewhat testaceous; the abdomen tessellated.

*Inhabits* Europe. B.

Bred in the larvæ of lepidopterous insects, and also in the roots of the cabbage, producing disease; it is like the *domestica*, but larger, hoary, the thorax obscurely lined.

30. *Musca brassicaria*. Black; the abdomen cylindrical; the second and third segments red.

*Inhabits* Europe. B.

Found on the roots of the cabbage.

31. *Musca lateralis*. Black; the sides of the abdomen red at the base.

*Inhabits* Europe. B.

32. *Musca canicularis*. Blackish; the second and third segment of the abdomen diaphanous on the sides.

*Inhabits* Europe. B.

Like the common house-fly, but only half the size; the forehead is silvery, ciliated with black. About midsummer, numbers of this species hover in the air under trees at sunset, and at mid-day. An insect is bred in putrid meat which very much resembles this, perhaps is only a variety of it; the first and second segments being yellowish and somewhat diaphanous, the margins blackish. The larva and pupa are set round with hooked setæ.

## MUSCA.

33. *Musca pluvialis*. Cinereous, the thorax with five black spots, the abdomen with obscure spots.

*Inhabits* Europe. B.

These dance in crowds in the air, chiefly before rain.

34. *Musca rapax*. Hairy and cinereous, the apex of the thighs, and the tibiæ ferruginous.

*Inhabits* England.

35. *Musca cellaris*. Black, the abdomen paler, the eyes ferruginous.

*Inhabits* Europe. B.

Found in wine cellars and moist places.

36. *Musca meteorica*. Black; the abdomen somewhat cinereous, the wings somewhat yellow at the base.

*Inhabits* Europe. B.

These insects, on the approach of rain, hover in the air in a playful manner, with a sort of jerking flight; and in clouds flock about the mouths of horses in summer: in warm weather, under trees, they make a constant humming, which is particularly observable about mid-day in still places. Their larvæ sometimes get into the human stomach.

37. *Musca putris*. Black; the wings white, with a black exterior margin.

*Inhabits* Europe. B.

The larva of this species is found in decaying cheese; when taken out it leaps instead of creeping; the fly is very small.

38. *Musca pumilionis*. Black; underneath, the head, and two lines on the thorax, yellow; the halteres white; the feet cinereous, black at the tips.

*Inhabits* Europe. B.

The larva lives in the stalk of wheat just above the root, and destroys that stalk; its head is sharp pointed, and black at the point.

39. *Musca Frit*. Black; the poisers, hinder tarfi, and abdomen of a pale green.

*Inhabits* Europe. B.

The larva of this species harbours within the husks of the ears of barley, and devours the grain; in Sweden the tenth of the crop has been thus destroyed at an annual loss of 100,000l.

## MUSCA.

40. *Musca cupraria*. Of a bluish bronze colour, the thorax green; the abdomen oblong and coppery, the halteres naked.

*Inhabits* Europe. B.

Found on flowers.

41. *Musca aurata*. Shining, the thorax bronzed, the abdomen obtuse and gilded.

*Inhabits* Europe. B.

Found in gardens, on fruit trees, flying briskly about noon, when the sun shines.

42. *Musca semi-argentata*. Thorax green, changeable to silver. Abdomen silvery, with shades of bright yellow and grey, and some transverse streaks of black, very changeable.

*Inhabits* England.

Given from Donovan, Plate 142. Found on Epping Forest.

43. *Musca polita*. Shining; thorax blue; abdomen bronze; halteres naked.

*Inhabits* Europe. B.

44. *Musca cristata*. Black; the tibiae pale; the crown of the head projecting.

*Inhabits* England.

45. *Musca unguolata*. Greenish bronze; the tail uncinated, the feet elongated and livid.

*Inhabits* Europe. B.

46. *Musca notata*. Hairy; the thorax with brown lines, the abdomen bronzed, the wings clouded with brown and a black dot.

*Inhabits* England.

Found on flowers; the head black, the abdomen short and obtuse, the feet long and black.

47. *Musca curvitans*. Black; feet long and pale, wings white and incumbent.

*Inhabits* England.

Found on trees; has the appearance of a *Cimex*; it runs swiftly, and hardly flies.

48. *Musca scybalaria*. Of a red ferruginous colour; the wings with a dark dot.

*Inhabits* Europe. B.

Like



## MUSCA.

Like the following species, but larger and of a deeper colour: it is found on dung.

49. *Musca fuscicornis*. Rough and grey; wings with a dark dot.

*Inhabits* Europe. B.

The most common dung fly.

50. *Musca umbrarum*. Cinereous; the abdomen with black fasciæ, the wings brown, with white spots.

*Inhabits* Europe. B.

51. *Musca vibrans*. Wings transparent, black at the apex; the head red.

*Inhabits* Europe. B.

Found in gardens; even when sitting it continually vibrates its wings.

52. *Musca cynipsea*. Wings with a lateral dot at the apex, the abdomen cylindrical.

*Inhabits* Europe. B.

Found in gardens; it has a pleasant smell; the fore pair of thighs are denticulated underneath.

53. *Musca stylata*. Cinereous; the abdomen black, the wings white; with two dots, and an arch at the apex, brown.

*Inhabits* England.

Found in woods.

54. *Musca flava*. Yellow; the antennæ black at the apex.

*Inhabits* Europe. B.

Wholly yellow, except the eyes which are black. Small, but it varies in size.

55. *Musca lineata*. Yellow below, black above; the thorax with yellow lines; the scutellum yellow.

*Inhabits* Europe. B.

Small; the head yellow, black on the top: thorax yellow, the back black. Wings not spotted. Found in August.

56. *Musca hyoscyami*. Wings with a sort of claw, white with brown spots.

*Inhabits* Europe. B.

Found on the heads of the *Hyoscyamus*, *Carduus*, and *Serratula arvensis*, and on umbelliferous flowers.

## MUSCA.

57. *Musca germinationis*. Wings white, with black margin, and black spots.

*Inhabits* Europe. B.

Found early in spring under the leaves of trees. It appears likewise in September.

58. *Musca cerasi*. Wings white, with brown, unequal fasciæ, the two last connected on the outside.

*Inhabits* Europe. B.

Found harbouring in cherry stones.

59. *Musca cardui*. Black; the wings white, with a brown waving fascia.

*Inhabits* Europe. B.

Found on the flowers of thistles.

60. *Musca solstitialis*. Wings white, with four black connected fasciæ; the scutellum yellow.

*Inhabits* Europe. B.

Found on the flowers of thistles; the larva lives on the seeds of the Burdock: the abdomen of the female tapers to a point.

61. *Musca onopordinis*. Ferrugineous; the scutellum yellow, the wings variegated.

*Inhabits* England.

Common in the summer on thistles.

62. *Musca hieracii*. Wings brown, variegated with white; the exterior margin with three black spots; the pupil white.

*Inhabits* England.

63. *Musca granditarsa*. Smooth; the thorax black bronze; the abdomen ferrugineous, black at the apex.

*Inhabits* England.

The abdomen is oblong, the femora and tarsi black; the last articulation large; the wings somewhat tawny, the pointers white.

B. *Haustellum* with three setæ.

64. *Musca scolopacea*. Cinereous; the abdomen yellowish, with a triple row of black dots; the wings clouded.

*Inhabits* Europe. B.

## MUSCA.

65. *Musca striata*. Thorax marked with lines, the abdomen black, the wings transparent with a brown spot, and the apex brown.

*Inhabits* England.

The antennæ incurved and longer than in the others of this section; the first pair of feet long and black.

C. *Haustellum* with four setæ. a. *Tomentoſe Plumata*.

66. *Musca bombylans*. Black; the abdomen rough, behind red.

*Inhabits* Europe. B.

67. *Musca mystacea*. Black; the thorax and abdomen yellow at the apex.

*Inhabits* Europe. B.

C. *Haustellum* with four setæ. b. *Tomentoſe ſetaria*.

68. *Musca pendula*. Thorax with four lines, the abdomen with three interrupted yellow fasciæ.

*Inhabits* Europe. B.

The larva is bred in stagnant waters; it suspends itself from the surface by means of its long slender filiform tail, which is also its organ of respiration.

69. *Musca florea*. Thorax fasciated with black, the abdomen yellow, the margins of the segments, and a line upon the back, black.

*Inhabits* Europe. B.

Found on flowers.

70. *Musca subcoleoprata*. Abdomen ferrugineous; back black, the wings somewhat thick.

*Inhabits* England.

71. *Musca nemorum*. Abdomen black; with three white bands and the first segment yellow at the sides.

*Inhabits* Europe. B.

Found on flowers.

72. *Musca frutetorum*. Thorax with two yellow lines;  
the

## MUSCA.

the abdomen ferrugineous ; a dorsal line interrupted, and black.

*Inhabits* England.

Found among trees.

73. *Musca tenax*. Thorax grey, the abdomen brown, the posterior tibiæ compressed and gibbous.

*Inhabits* Europe. B.

The larva lives in wet dunghills, putrid waters, jakes, &c. it is quite soft, with a tail formed of two pieces that go within each other, like the pieces of an opera glass. Linnæus says it will survive the force of a book-binder's press.

74. *Musca intricaria*. Yellowish ; the abdomen black, white at the apex ; the knees white.

*Inhabits* Europe. B.

75. *Musca arcuata*. Black ; antennæ elongated ; thorax with yellow spots on the sides ; the abdomen with yellow arched bands.

*Inhabits* Europe. B.

76. *Musca devia*. Thorax bluish, the abdomen of a dark violet colour.

*Inhabits* England.

77. *Musca fastuosa*. Of a bluish violet colour ; the feet brown, the tarsi ferruginous.

*Inhabits* England.

Found in the neighbourhood of Edinburgh. Less than the *devia*. The eyes are brown, the halteres ferruginous : it is smooth, with hardly any tomentum.

78. *Musca sphaega*. Black ; the antennæ elongated ; the feet red.

*Inhabits* England.

79. *Musca festiva*. Smooth ; the thorax with yellow lateral lines, the abdomen with four yellow interrupted bands.

*Inhabits* Europe. B.

Found on flowers ; the feet yellow.

80. *Musca globosa*. Slightly downy ; the thorax ferrugineous on the fore part ; the abdomen nearly globular and pale ; black at the apex.

*Inhabits* England.

## MUSCA.

81. *Musca ribesii*. Black and nearly smooth; thorax not spotted; the abdomen with four yellow bands; the first interrupted.

*Inhabits* Europe. B.

Found among the Aphides of the Currant.

82. *Musca pyrastræ*. Black and nearly smooth; the thorax not spotted; the abdomen with six white recurved lunated spots in two longitudinal rows.

*Inhabits* Europe. B.

The larva is green, with a white longitudinal line on the back; the head is acute. It feeds among the Aphides of the Pear-tree; also of the Nettle and others. About the beginning of July it enters into the pupa state, and towards the end of that month, the fly appears.

83. *Musca menthastri*. Smooth and black; the thorax spotted; the abdomen with four yellow bands, and a yellow scutellum.

*Inhabits* Europe. B.

Found on flowers, particularly those of the Mint; the larva among Aphides.

84. *Musca albimana*. Thorax bronze coloured; abdomen elongated and black, with four white dots.

*Inhabits* England.

Found in gardens; abdomen silky, the feet brown; the anterior tibiæ white.

85. *Musca pipiens*. Smooth and black; the abdomen spotted with white on the sides, the hinder thighs clavated and dentated.

*Inhabits* Europe. B.

Found hovering over the flowers of Mint, &c.

86. *Musca fegnis*. Smooth; thorax bronzed; the abdomen ferrugineous, black at the apex, the hinder thighs clavated.

*Inhabits* Europe. B.

GEN. XCIX. TABANUS. Mouth with a straight exerted membranaceous proboscis, ending in an ovate capitulum or knob; with two equal lips; the  
haustellum

## TABANUS.

haustellum projecting, exerted, and received into a groove in the back of the proboscis: the vagina univalve, with five setæ and two equal palpi, the last articulation of which is thicker than the rest. Antennæ short, approximated, cylindrical, with seven articulations; the third generally largest and armed with a lateral dent.

The insects of this genus suck the blood of animals; they are of a dull plain appearance, but their large eyes are, in general, beautifully coloured; these colours fade after they are dead, though they may be in some measure restored by the application of warm water; their larvæ live under ground in meadows.

1. *Tabanus bovinus*. Horse-fly. Eyes greenish; the back of the abdomen marked longitudinally with white triangular spots.

*Inhabits* Europe. B.

The terror of horned cattle, horses, &c. which, in summer, it harasses without mercy; it pierces their hides, and sucks their blood; for which purpose, the apparatus of its mouth is particularly fitted.

2. *Tabanus autumnalis*. With transparent wings; the abdomen brown, with three rows of whitish spots.

*Inhabits* Europe. B.

3. *Tabanus paganus*. Eyes green on the forepart, with three orange-coloured fasciæ; the abdomen marked on the sides with ferruginous spots.

*Inhabits* England.

4. *Tabanus tropicus*. Eyes with three purplish fasciæ; the sides of the abdomen ferrugineous.

*Inhabits* Europe. B.

The pest of cattle, but particularly of horses, on the approach of rain.

5. *Tabanus phuvialis*. Eyes with four waved fasciæ; the tibiae white.

*Inhabits* Europe. B.

The most common of the genus; it does not spare man,  
but

## TABANUS.

but lighting on the unprotected parts, speedily draws the blood, and makes a wound, which is painful for a considerable time, leaving inflammation and swelling.

6. *Tabanus cecutiens*. Eyes green with black dots; the wings spotted.

*Inhabits* Europe. B.

This too infests the traveller, or persons walking in lanes and woods, in June and July. It conceals itself in the crevices of the bark of trees, or among the foliage, till about an hour before noon, and continues to be very troublesome till about five or six o'clock in the evening.

- GEN. C. *CULEX*. With an exerted, univalve, flexible vagina; five setæ. Two palpi consisting of three articulations. Antennæ filiform.

The insects of this genus, the females particularly, puncture the skins of man and other animals, and suck the blood; they are frequently preyed on by the smaller birds; their larvæ live in water, they want feet, are the favourite food of ducks and other water fowl; their thorax is large, their abdomen cylindrical; they swim in the water by curvations, or flapping their body sideways, this way and that; they respire through a cylindrical tube at the anus; they are agile, and feed on aquatic animalcula; the pupa is inactive, incurved, and of an oval shape; with a club-head and slender abdomen; its respiratory organs, are two horn-like bodies on the back.

1. *Culex pipiens*. Cinereous, the abdomen with eight brown rings.

*Inhabits* Europe, and the northern parts of Asia and America. B.

This insect is frequent in the neighbourhood of waters and marshy places. In southern regions it is larger, and goes by the common name of Musquetoë. Its bite is painful, raising a considerable degree of inflammation, and its continual piping note is exceedingly irksome where it abounds, especially during the night. When it settles to inflict the wound and draw the blood, it raises its hind pair of feet. In Lapland, the injuries the inhabitants sustain from it, are amply repaid by the vast numbers of water fowl and wild fowl which it attracts, as it forms the favourite food of their young,

## CULEX.

young. The larva sometimes makes its way into the lungs and intestines of animals, raising an inflammation, which proves fatal in four or five hours. It is expelled by the smoke of Elecampane and hemp.

1. *Culex ciliaris*. Of a testaceous or brown colour; the wings ciliated.

*Inhabits Europe.* B.

Like the former species, but only half the size, the antennæ black, hairy, and verticillated, the abdomen somewhat brown.

3. *Culex bifurcatus*. Brown, the thorax obscurely marked with lines.

*Inhabits Europe.* B.

This species does not bite; the rostrum is prominent, and the vagina bifurcated at the apex, dilated into two spreading blades.

4. *Culex pulicaris*. The Midge. Brown, the wings white, with three obscure spots.

*Inhabits Europe and America.* B.

This species, when it bites, leaves a brown spot. The larva is of a dirty white colour, swims in stagnating waters by a wriggling motion; the pupa is small, with a black head, little short horns, and spotted rough abdomen; it lies quietly on the top of the water, now and then gently wagging itself this way and that.

5. *Culex Morio*. Black; wings white, hinder thighs clavated and ferrated.

*Inhabits England.*

- GEN. CL. EMPIS. Haustellum inflected, an univalve vagina and three setæ, with a proboscis. Palpi short and filiform. Antennæ setaceous.

The changes of these insects are unknown; they are common on flowers and in gardens; their head is small and round, the thorax gibbous, the feet long, the proboscis small and inflected.

1. *Empis pennipes*. Black; the hinder pair of feet long and feathered.

*Inhabits Europe.* B.

Found



## EMPIS.

Found on the *Geranium sylvaticum*, and *Cardamine pratensis*. While in search of the nectareous juice of flower, the pollen sticks to its feet, and it is supposed to assist the fructification by imparting the farina to the stile.

2. *Empis livida*. Of a livid colour, the thorax marked with three black lines, the base of the wings and the feet ferruginous.

*Inhabits Europe.* B.

Found on the flowers of the *Heracleum sphondylium*; the wings oblong with brown veins.

3. *Empis forcipata*. Cinereous; the wings oblong, with a black spot on the margin, an appendage at the tail.

*Inhabits Europe.* B.

4. *Empis stercorea*. Testaceous, with a black line along the back, the wings reticulated.

*Inhabits Europe.* B.

Found on the flowers of umbelliferous plants.

**GEN. CII. STOMOXYS.** Haustellum, with an univalve vagina and setæ, inclosing one another. Two short, setiform, triarticulated, palpi. The antennæ with a seta.

The species of this genus are troublesome to cattle; their metamorphosis is unknown.

\* *Vagina convoluted and geniculated at the base, with two setæ.*

1. *Stomoxys calcitrans*. Grey, the antennæ somewhat plumated; the feet black.

*Inhabits Europe.* B.

Infests the feet of cattle, and occasions their continual kicking; it bites severely at the approach of rain; it likewise attacks man, biting the legs, and leaving a red spot, which is bright red in the middle, and continues a considerable time. It is so like the common house fly, that it cannot be distinguished without examining the mouth, when its subululated, black, and horny rostrum sufficiently points out the difference.

2. *Stomoxys*

## STOMOXYS.

1. *Stomoxys irritans*. Cinereous, somewhat hairy, the abdomen with black spots.

*Inhabits* Europe. B.

Sits upon the back of cattle, who endeavour to sweep it off with their tail, which, for that purpose, is continually in motion. It is like the former species, but only half the size.

\*\* *Vagina covering the mouth; with four seta.*  
Rhingia, Fabr.

2. *Stomoxys rostrata*. Thorax somewhat lineated; the rostrum, abdomen, and feet testaceous.

*Inhabits* Europe. B.

Troublesome to cattle; size of the house fly; wings pale.

GEN. CIII. CONOPS. Mouth with a porrected, geniculated rostrum. Antennæ clavated; the clava acuminate.

The insects of this genus suck the blood of animals.

\* *The haustellum with an univalve abbreviated vagina: a single seta.*

1. *Conops vesicularis*. Blackish; on the hind head a small pellucid vesicle; the abdomen yellowish, black at the base.

*Inhabits* Europe. B.

2. *Conops macrocephala*. Black, the abdomen with four segments, yellow on the margin; the antennæ and feet red.

*Inhabits* Europe. B.

3. *Conops flavipes*. Black and smooth, the abdomen cylindrical, with three segments yellow on the margin.

*Inhabits* Europe. B.

\*\* *Haustellum geniculated at the base, and in the middle; the vagina bivalve; the valves equal.*  
Myopa, Fabr.

4. *Conops ferruginea*. Of a ferruginous colour, the abdomen

## CONOPS.

abdomen cylindrical and incurved; the fore legs yellowish.

*Inhabits* Europe. B.

**GEN. CIV. ASILUS.** Mouth with a horny, pointed, straight, bivalve haustellum, which is girt at the base. Antennæ filiform.

The insects of this genus live by preying on those of dipterous and lepidopterous orders. When they are at rest, their wings, in general, are incumbent on the abdomen, which is long and small, often hairy, particularly the sides, and these end in strong claws. Their larvæ feed in the earth on the roots of plants; they change into a pupa covered with setæ.

1. *Asilus crabroniformis*. Abdomen tomentose, the first segments black, the hinder ones yellow, iridescent.

*Inhabits* Europe. B.

The largest of the British Asili. Frequents moist damps.

2. *Asilus gibbosus*. Hairy and black; the abdomen white behind.

*Inhabits* Europe. B.

3. *Asilus ater*. Hairy and black; white hairs on the face like a beard.

*Inhabits* Europe. B.

It sits on its breast with its feet expanded; like the preceding species, but shorter; the claws white.

4. *Asilus flavus*. Hairy and black; the thorax circular behind; the abdomen above hairy, and of an orange colour.

*Inhabits* Europe. B.

The feet are ferruginous; the beard on the head white.

5. *Asilus gilvus*. Black, the abdomen of an orange colour above.

*Inhabits* Europe. B.

The abdomen consists of seven segments; the three anterior are red; the fourth and fifth dark brown; the two posterior black.

6. *Asilus*

## ASILUS.

- 6 *Asilus marginatus*. The halteres and incisures of the abdomen yellow; the thighs black.

*Inhabits* Europe. B.

7. *Asilus forcipatus*. Rough and cinereous; the anus and feet black.

*Inhabits* Europe. B.

The most common of the genus. It is likewise found in the East Indies; but three times larger than ours.

8. *Asilus tipuloides*. Cinereous and smooth; the feet ferruginous; the under side of the tarsi black.

*Inhabits* Europe. B.

9. *Asilus oelandicus*. Black and smooth; the feet and halteres ferrugineous.

*Inhabits* Europe. B.

The feet are sometimes black; the wings sometimes black, sometimes transparent; the abdomen is black and shining; thicker at the extremity than at the base.

10. *Asilus Morio*. Rough and black; the wings variegated with black and white.

*Inhabits* Europe. B.

The connecting link between this genus and the following.

11. *Asilus culiciformis*. Black and smooth; the hind thighs the length of the abdomen.

*Inhabits* England.

GEN. CV. BOMBYLIUS. Mouth with a very long, setaceous, straight, bivalve haustellum; the valves unequal with three setæ. Two short hairy palpi: antennæ subulated, united at the base.

The insects of this genus, while they fly, suck the nectareous juices of flowers. Their metamorphosis has not hitherto been observed.

1. *Bombylius major*. Wings half black, half white, sinuated.

*Inhabits* Europe. B.

That half which lies along the exterior margin is black, the other white.

## BOMBYLIUS.

2. *Bombylius medius*. Wings dotted with brown ; brownish yellowish ; white behind.  
Found in the fields early in spring.
3. *Bombylius minor*. Wings not spotted.  
*Inhabits* Europe. B.  
Found in the fields : the body is rough and yellowish ; the feet testaceous.

GEN. CVI. HIPPOBOSCA. Mouth with a short, cylindrical, bivalve haustellum ; the valves equal. Antennæ filiform ; feet with several claws.

The insects of this genus live by sucking the blood of animals ; and stick so fast to their skins, that they must be torn before they can be taken off.

1. *Hippobosca equina*. Wings obtuse ; the thorax white and variegated ; the feet with four claws.  
*Inhabits* Europe and America. B.  
Infests horses and cattle ; and attacks them chiefly about the groin and the perinæum ; it is very tenacious of life ; it brings forth neither eggs nor larvæ, but pupæ ; the wings are crossed and complicated.
2. *Hippobosca avicularia*. Wings obtuse, the thorax of one colour.  
*Inhabits* Europe. B.  
Found on Swallows and other birds ; only half the size of the former species ; the wings longer than the body, with black lateral veins ; the abdomen hollowed behind and dotted, with two doubled claws.
3. *Hippobosca birundinis*. Wings subulated, the feet with six claws.  
*Inhabits* Europe. B.  
Found on swallows chiefly.
4. *Hippobosca ovina*. Without wings.  
*Inhabits* Europe. B.  
Found among the wool of sheep ; of a testaceous colour ; the abdomen distended, pale, and obtuse. It wants wings and might, therefore, be considered as belonging to the following Order of insects ; but its habit in other respects and manners shew it to be a true *Hippobosca*.

§ 262.

ORDER VII. APTERA. \*

THE last Order consists of such insects as want wings, and never have any; it contains animals of very various appearance, some of which approach the subjects of the next class, and make a natural transition to it. Their change is complete (*pupa completa*), for, from the egg comes the young insect, similar in appearance to the perfect insect; it changes its skin several times, but varies in nothing except in size and colour. In some, however, as in the *Acarus* and *Scolopendra*, new parts are produced, and the *Pulex* goes through the common transformations. In some, the head forms one piece with the thorax. Some have six feet, others eight, and some have more than one hundred feet. At the mouth some have naked, others covered maxillæ; some want maxillæ altogether, and others are furnished with a proboscis. The number of eyes is various; in general, they are simple. In manners, and in food, the Aptera are likewise exceedingly various.

GEN. CVII. LEPISMA. Mouth with four palpi, two setaceous, and two capitated; the lip membranaceous, round, and emarginated. Antennæ fetaceous. Body covered with imbricated scales; extended bristles at the tail; six feet formed for running.

The insects of this genus, in all their stages, live on sugar, putrid wood, and filth: they merely change their skin; the larvæ

\* From  $\alpha$  priv. and  $\pi\eta\rho$ , a wing.

## LEPISMA.

larvæ and pupæ have likewise six feet, and run about with agility.

1. *Lepisma saccharinum*. With silvery scales, and a triple tail.

*Inhabits* America and Europe. B.

This insect is a native of America, whence it has been brought to Europe, where it is now common in furniture, books, and cloathes: likewise in damp wainscot and the sashes of windows. The antennæ are as long as the body; the thorax is covered with two scutæ; besides the three legs at the tail there are two smaller under it.

2. *Lepisma polyopus*. Leaps; the tail triple, the segments of the abdomen villous on both sides underneath.

*Inhabits* Europe. B.

Found on sandy shores; leaping very quickly.

GEN. CVIII. PODURA. Mouth with four sub-clavated palpi and a bifid lip. Two eyes composed of eight pieces. Tail bifurcated, inflected, and formed for leaping. Six feet formed for running.

The insects of this genus, in all their stages, live on the leaves of plants; they only change their skins, not their appearance; the larva and pupa have six feet, and run with agility.

1. *Podura viridis*. Nearly globular and green.

*Inhabits* Europe. B.

On plants; frequent on the Buckwheat.

2. *Podura polyopus*. Nearly globular and black; the antennæ  $\frac{1}{2}$  the length of the body, white at the apex.

*Inhabits* Europe. B.

3. *Podura atra*. Globular, brown, and shining; the antennæ long, with many articulations.

*Inhabits* Europe. B.

4. *Podura plumbea*. Somewhat cylindrical, of a shining bluish brown colour.

*Inhabits* Europe. B.

5. *Podura nivalis*. Oblong and cinereous; marked with black characters.

*Inhabits* Europe. B.

Found

## PODURA.

Found in woods and timber; in winter it is seen in numbers together on the snow, running very quickly, particularly in the footsteps of men and animals; in summer it is frequent on the berries of currants, but is then solitary.

6. *Podura villosa*. Oblong, villous and variegated with brown and black.

*Inhabits* Europe. B.

7. *Podura aquatica*. Black, and confined to the water.

*Inhabits* Europe. B.

Found on still and stagnant waters: it walks and leaps on the water as other insects do on land.

8. *Podura fmetaria*. White, and confined to the land.

*Inhabits* Europe. B.

Found early in spring on new ploughed land; this species does not leap.

- GEN. CIX. TERMES. Mouth with two horny maxillæ; the lip horny and quadrifid; the lacineæ linear, acute, and filiform, with four equal palpi. Antennæ, in most species, moniliform. Two eyes.

The insects of this genus might perhaps be arranged with those of the Neuroptera or Hymenoptera Orders, being related to the first in their larva state, and to the latter as perfect insects. They consist of males, females, and neuters; the males have wings, but the females and neuters never have any.

1. *Termes fatale*. The white Ant. Brown above, the thorax with three segments; the wings pale, the exterior margin testaceous.

*Inhabits* India and Africa.

This insect is a most formidable one in the countries it inhabits; it is small, being only about a line and half, or two lines long; it is eaten with avidity by domestic poultry, birds, and lizards, and even by the native inhabitants. These insects form a kind of arched roads, about half an inch wide, concave, and flattish; these are often built on the floors and ceilings of houses, extending many hundred feet in length, with a variety of serpentine windings. Within these cavities the insects live in a well ordered society. In the woods they inhabit large round nests, divided into a variety of cells by



## TERMES.

by thin incruſted partitions : theſe neſts are many feet in circumference, and contain millions of inſects. They deſtroy furniture, viſtuals, cloathes, houſes, ſhips, &c.

2. *Termes fatidicum*. The abdomen ovate, mouth pale; eyes brown; antennæ ſetaceous.

*Inhabits Europe.* B.

Like the following ſpecies, but ſomewhat larger.

3. *Termes pulſatorium*, Death-watch. Abdomen oblong, mouth red, eyes yellow, antennæ ſetaceous.

*Inhabits Europe.* B.

A very common inſect; found in old books, old furniture, collections of inſects, &c. the pupa beats on thin wood with its head, and ſometimes with its tail, in a regular manner, making a noiſe like the beat of a watch; ſometimes it beats only ſeven or eight times, and ſometimes for a whole hour without intermiſſion: it appears that the females only beat, whence we may conclude that the operation is connected with the functions exerciſed by her, and may contribute to the excluſion or proper diſpoſition of the eggs.

- A GEN. CX. PEDICULUS. Louſe. Mouth with a retractile recurved hauſtellum, without proboscis or palpi. Antennæ the ſame length with the thorax. Two eyes: Abdomen depreſſed and ſomewhat lobed. Six feet formed for walking.

The inſects of this genus are ſmall, and live by ſucking the blood and juices of animals. They are perhaps the moſt univerſally diſtributed of all the Clafs, as ſome of them infeſt the bodies of moſt quadrupeds and birds; nay even fiſhes and other inſects are not free from them.

1. *Pediculus humanus*. Common L. The abdomen lobated and cinereous.

*Inhabits every where.*

This inſect harbours in the hair and cloathes of dirty, and diſeaſed people. In the head it is harder and of a deeper colour. On negroes it is black: it may be expelled by cleanlineſs, by mercury, pepper, ſaffron, and the ſeeds of laurel, angelica, pariſley, rue, moonſeed, hellebore, &c.

2. *Pediculus*

**PEDICULUS.**

2. *Pediculus pubis*. Crab L. The abdomen emarginated behind, the feet cheliform.

*Inhabits every where.*

This species, which likewise attaches itself to uncleanly persons, may be removed by tobacco oil, mercury, &c.

3. *Pediculus ricinoides*. The abdomen round, with a white line; the scutellum trilobated, the rostrum white.

*Inhabits America.*

This species is what is called by the French in the West Indies *Le bete rouge*. It gets into the feet, and deposits its eggs, causing malignant ulcers and such an itching that the person affected cannot refrain from scratching, though he is sure, that by so doing, he will bring on a disease of which he will not soon get rid. The parts are bathed with warm water, or with lemon juice, to make the animals fall off, the whole body being sometimes covered with them.

We shall pass quickly over this disgusting genus. The following are probably natives of Britain.

4. *Pediculus Suis*. Lives on the Hog.
5. *Pediculus Cervi*. Lives on the Deer.
6. *Pediculus Bovis*. The abdomen with eight ferruginous transverse lines. On Cattle.
7. *Pediculus Vituli*. Abdomen acuminate, and of a leaden colour. Lives on Oxen.
8. *Pediculus Equi*. On the Horse.
9. *Pediculus Tinnunculi*. Head sagittated, and pointed behind on both sides. On Hawks.
10. *Pediculus Buteonis*. Abdomen marginated, two black dots on each side of the segments. On the Buzzard.
11. *Pediculus Strigis*. Abdomen ovate and white; the margin and feet red. On Owls.
12. *Pediculus Corvi*. Abdomen ovate; margin striated. On Crows.
13. *Pediculus Cornicis*. Abdomen ovate and pale, with black spots on the sides, having a white pupil. On the Raven.
14. *Pediculus Picae*. Head brown and obtuse; with four black dots. On the Magpie.

15. *Pediculus*

**GEN. CXL. PULEX. Flea.** Mouth without palpi or maxillæ; an elongated, inflected rostrum, covered at the base with two ovate laminæ; a bivalve vagina, consisting of five articulations, with a single seta; lip rounded, and ciliated with reflexed spines. Antennæ porrected, moniliform, and growing thicker towards the points. Two eyes, the abdomen compressed. Six feet formed for leaping.

This genus hath many characters in common with the insects of the Order Hemiptera: it consists but of two species, which live on the blood of animals; the larva wants feet, is cylindrical and active, with two cylindrical spines under the tail; the pupa is motionless, and very like the perfect insect.

1. *Pulex irritans.* Rostrum shorter than the body.

*Inhabits* Europe and America. B.

This little animal is sufficiently known, and, less disgusting than its fellow blood sucker of the preceeding genus, has sometimes even become a favourite with ladies, who have pleased themselves with keeping, taming, and feeding it. A golden chain has been made for it with a lock and key, and being kept in a box with wool, in a warm place, and fed daily, it has been known to live for six years. Its muscular strength is so great that it can leap 200 times its own length, and drag a weight eight times heavier than itself. Fleas are particularly fond of hares, cats, dogs, &c. but leave them the moment they die, or very soon after. They are expelled by means of Savoury leaves, those of Penny royal, Alder, &c.

2. *Pulex penetrans.* The rostrum as long as the body.

*Inhabits* America.

This species called by the English in the West Indies, the Chiger, or *Jigger*, by the French la *Chique*, fixes itself in the feet, chiefly between the nails and the flesh, and eats its way onwards, depositing its eggs, which are exceedingly minute, in a bag: it is discovered by the uneasy itching it occasions, and must be extracted with great caution and dexterity; for if the bag is burst, and any of the eggs or animals remain, an abscess is often formed which prevents the use of the limb. The slaves who go barefooted, are chiefly exposed to this calamity.

GEN.

**GEN. CXII ACARUS.** Mouth without a proboscis, an haustellum and bivalve cylindrical vagina, with two compressed, equal palpi, of the length of the haustellum. Two eyes at the sides of the head. Eight feet.

The insects of this genus are the smallest of the Class, and are found every where in immense numbers; in all their stages they live on the juices of animals, and are the cause of many diseases. The larvæ and pupæ have six feet.

\* *The antennæ filiform, compressed, appearing like feet.*

**Acarus Reduvius.** The Tick. Obovate and plane, with an obovate spot at the base.

*Inhabits Europe. B.*

Found on oxen, dogs, and even on man. Frequently found alive in wool, a long time after it is shorn.

**Acarus Ricinus.** The Dog Tick. Somewhat round or ovate; with a round spot at the base; the antennæ clavated.

*Inhabits Europe. B.*

Frequent on oxen and dogs.

**Acarus Vespertilionis.** Thorax angulated and crossed, the feet armed with claws, and longer than the body.

*Inhabits Europe. B.*

Found on the Bat; like a Phalangium; it cannot walk on smooth ground.

**Acarus passerinus.** The third pair of thighs very thick.

*Inhabits Europe. B.*

Found on the Passeres or small birds.

**Acarus aphidioides.** Red; the first pair of feet very long, and used for running; the abdomen with two small horns behind.

*Inhabits Europe. B.*

Found in putrid wood, and under stones, &c.

**Acarus telarius.** Reddish, and somewhat transpar.

## ACARUS.

ent; the abdomen with a brown spot on each side.

*Inhabits* Europe. B.

Found on plants not much exposed to the wind; in a hot-house they spin a web of parallel threads, which suffocates the plants; they are frequent in autumn on the leaves of the lime-tree.

7. *Acarus Siro*. The Mite. Whitish, the thighs and head ferruginous; the abdomen set with bristles.

*Inhabits* Europe. B.

Found frequently in cheese and flour.

8. *Acarus scabiei*. White, the feet reddish; the four hind ones armed with a very long bristle.

*Inhabits* Europe. B.

Found in the ulcers produced by the itch, and causing the titillation: much less than the Mite.

9. *Acarus lactis*. Abdomen ovate and obtuse, armed behind with four declining setæ of the length of the body.

*Inhabits* Europe. B.

Found in cream long kept, and in dairies where the milk-vessels are not cleaned.

10. *Acarus baccharum*. The abdomen distended and red: the sides darker.

*Inhabits* Europe. B.

Found on the currant, gooseberry, strawberry, and other berries.

11. *Acarus muscorum*. Abdomen red, the hind feet very long and filiform.

*Inhabits* Europe. B.

Found on mosses.

12. *Acarus gymnopteronum*. Abdomen red, with two scarlet spots on each side.

*Inhabits* Europe. B.

Found on Wasps, Bees, Dragon flies, &c.

13. *Acarus coleopterorum*. Ovate and brownish red, the tail whitish.

*Inhabits* Europe. B.

Found on beetles, particularly the Scarabæi and Silphæ.

14 *Acarus*

ACARUS.

- . *Acarus phalangii*. Ovate and red ; the rostrum porrected, the feet longer than the body.

*Inhabits* Europe. B.

Found on the Phalangia and Spiders, adhering to them closely by its feet, and other parts of its body.

- . *Acarus rupestris*. Brown ; with a line upon the back of two colours.

*Inhabits* Europe. B.

Found under stones.

- . *Acarus longicornis*. Red, antennæ bifid, longer than the rostrum.

*Inhabits* Europe. B.

Found on rocks and under stones.

- . *Acarus littoralis*. Ovate and red ; the rostrum porrected and subulated.

*Inhabits* Europe. B.

Found on the sea shore, among the stones ; the abdomen very obtuse, with some sunk dots on both sides.

- . *Acarus fungorum*. Reddish brown ; the abdomen somewhat globular, smooth, and not spotted.

*Inhabits* Europe. B.

Found gregarious in mushrooms : walks slowly.

- . *Acarus scaber*. Cinereous and depressed ; the sides rough,

*Inhabits* Europe. B.

Found early in spring on the ground.

- . *Acarus salicinus*. Red ; with two brown lines on the back ; bifurcated before.

*Inhabits* Europe. B.

Found on willows ; very nimble.

- . *Acarus vegetans*. Crustaceous, yellowish brown, margined ; convex above, flat beneath.

*Inhabits* Europe. B.

Found on Coleopterous insects, adhering in a singular manner by a pedicle or flexible stalk. Dr Shaw thinks it the larva of the *Acarus coleoptratorum*.

- . *Acarus autumnalis*. The Harvest Bug. Red and globose, with the abdomen bristly behind.

*Inhabits* Europe. B.

Given

## ACARUS.

Given from Shaw's Naturalists Miscellany, Vol. II.

42. Smaller than a mite, and of a bright scarlet colour Hampshire, and other chalky districts, very troublesome August and September, getting into peoples skins, esp those of women and children, and raising tumours, itch considerably. They are to be met with in garden kidney beans, or any legumens.

*\*\* Antennæ setaceous.* Trombidium, Fabr.

23. *Acarus aquaticus.* The abdomen blood-red pressed and tomentose, obtuse behind.

*Inhabits Europe.* B.

Found in fresh waters, where it swims with great vel

24. *Acarus holosericeus.* The abdomen scarlet, d fed and tomentose, hollowed behind.

*Inhabits Europe and America.* B.

Found on the ground in May and June. So lik last, as hardly to be distinguished, but perishes if put i ter.

**GEN. CXIII. HYDRACHNA.** Head, thorax, abdomen united. Two articulated palpi; eyes four, or six; eight feet.

The knowledge of the insects of this genus, is due t industry of Muller: they live under water, where they seem to be the link which connects the Acari w<sup>th</sup> Aranæ: they live on the larvæ of Tipulæ and Mon they lay red spherical eggs, which, in the space of a u grow pale and crescent-shaped; from these, the young ceed, with six feet, and a singular proboscis, and, casting skin, turn at last to an insect with eight feet.

*\* With two eyes.*

1. *Hydrachna globator.* Globular, the eyes red.

*Inhabits Europe.* B.

Found in ditches; the male greenish and spotted; th male bluish, without spots.

2. *Hydrachna maculator.* Cinereous, rounded, and ted; pointed behind; the tail depressed, and dentated.

*Inhabits Europe.* B.

HYDRACHNA.

Found in marshes ; the breast whitish, the feet green.

3. *Hydrachna integrator*. Green and not spotted ; the tail depressed and intire.

*Inhabits* Europe. B.

Found in ditches. The breast yellow ; the feet pellucid.

4. *Hydrachna grossipes*. White, somewhat square, with three spots, and a red forked spot on the back ; the fore-legs thick.

*Inhabits* Europe. B.

Found in ponds and ditches ; pellucid and smooth ; the feet twice as long as the body.

5. *Hydrachna cruenta*. Blood-red and distended, the feet equal.

*Inhabits* Europe. B.

Found in meadows that have been overflowed ; the eyes red ; the palpi pubescent.

6. *Hydrachna impressa*. Red and distended ; marked above with impressed dots, the palpi short.

*Inhabits* Europe. B.

Found in clear stagnant water in summer ; about the fifth of an inch long.

\*\* *With four eyes.*

7. *Hydrachna undulata*. Oval and yellow ; with waving black streaks.

*Inhabits* Europe. B.

Found in watery places. Nearly globular, shining and transparent, with black eyes.

\*\*\* *With six eyes.*

8. *Hydrachna umbrata*. Red and round ; with many spots.

*Inhabits* Europe. B.

Found in marshes in woods ; smooth, shining, with more than ten dark spots ; eyes black, palpi very small, yellowish at the apex ; feet yellow.

GEN. CXIV. PHALANGIUM. Mouth with two filiform palpi, the mandibles horny, the second articulation with a very acute, moveable, cheliferous dent. No antennæ. Two eyes close together on the



## PHALANGIUM.

the crown of the head, two on the sides. Eight feet. The abdomen, in most of the species, rounded.

This genus is allied to those of *Acarus*, *Aranea*, and *Scorpio*, whence it is difficult to determine some of the species. In all their stages, the *Phalangia* feed on other insects and vermes; the larvæ and pupæ are active; have eight feet, and are very like the perfect insect.

\* *With a conical tubular haustellum.*

1. *Phalangium grossipes*. Body small and cylindrical, the shoulders tuberculated; the feet much longer than the body.

*Inhabits Europe. B.*

Found at Milford Haven. It is a very small sluggish animal, of a dirty red colour, and jointed; it enters the shells of muscles, and exhausts them.

2. *Phalangium balenarum*. With two palpi; the body ovate.

*Inhabits Europe. B.*

Found in the northern ocean, under stones: the back red; the haustellum porrected, straight, obtuse at the apex, perforated, round, and entire; the palpi as long as the haustellum, and situated at its base; the feet articulated and cornered.

\*\* *Without a haustellum.*

3. *Phalangium Opilio*. The abdomen ovate, grey; below white.

*Inhabits Europe and America. B.*

This insect has, at first sight, the appearance of a spider with very long legs; but, it has only two eyes, and spins no web. In August the females are frequently big with eggs, which are perfectly round. They are out chiefly in the night.

4. *Phalangium cornutum*. The abdomen depressed, the mandible conical and ascending; the palpi like feet.

*Inhabits Europe. B.*

The last articulation of the palpi, but one, has a moveable palpiform articulation.

5 *Phalangium*

PHALANGIUM.

5. *Phalangium cancrroides*. The abdomen obovate and depressed; with smooth chelæ; the toes hairy.

*Inhabits* Europe. B.

Found in close shady places, and in damp cellars; it walks backwards; preys on termites and acari; is hurtful to dried plants; it even enters the skin and raises a very painful swelling of the size of a pea.

6. *Phalangium bimaculatum*. The abdomen black with two white spots.

*Inhabits* England and Norway.

7. *Phalangium hirsutum*. Body somewhat flat, with ten angles.

*Inhabits* England.

Found at Milford Haven. Body oval, and marked with a transverse band at the centre; antennæ serrated on the interior side; feet eight and hairy; tail cylindrical and obtuse; colour palish brown; length of an inch. Given from *Linnaean Transactions*, Vol. V. p. 7.

GEN. CXV. ARANEA. Spider. Mouth with short horny maxillæ, and a short lip rounded at the apex; two incurved articulated palpi, very acute at the tips, which, in the males, are clavated, and contain the genital organs. No antennæ. Eight eyes, seldom six. Eight feet. The papillæ which produce the threads, situated at the anus.

The insects of this genus live by preying upon other insects, especially those of the Diptera Order, though they do not even spare their own kind; their dark, insidious, and solitary manners, and the idea that they are poisonous, are no doubt the reason of the common, and almost unconquerable prejudice that many people entertain against them. Their bite, according to Harvey's experiments, certainly has something venomous in it, and a fly which has once felt it, can never be recovered, but soon dies in convulsions. The whole animal, however, can be swallowed with impunity, and the domestic spider can be tamed, and learns to know its benefactors, as appears from the stories of the *Compte de Lauzun* while in prison at Pignerol, and of Pelisson in the Bastile.

## ARANEA.

tile. They do not all make webs; some taking their prey by surprize. They can sustain life for six months without food. They often change their skins; the female sometimes carries her eggs about with her in a bag. The larvæ and pupæ have both eight feet, and are like the perfect insect. The genus is numerous, and is divided according to the disposition of the eyes.

\* *Eight eyes, arranged thus* : ∴ :

1. *Aranea Diadema*. The abdomen nearly globular, and of a reddish brown colour, marked with a cross composed of white dots. (Plate VIII. fig. 14, 15.)  
*Inhabits Europe.* B.

A large and very beautiful species; found on trees, hedges, and among rocks; it makes a large web, in the midst of which it watches. Lister says, that at times this, and some others which sit in the middle of their webs, communicate to them a sudden tremulous motion, as if to shake the dust from them.

2. *Aranea cucurbitina*. The abdomen somewhat globular and yellow, with a few black dots.  
*Inhabits Europe.* B.

This species makes a small web in proportion to its size, which is likewise singular, in being stretched horizontally.

3. *Aranea labyrinthica*. The abdomen ovate and fuscous, with a whitish pinnated line; the anus bifurcated.

*Inhabits Europe.* B.

A large species; it makes a spacious web, and resides concealed in a cylindrical cavity at the bottom of it. Threads are attached at a great height above, like the ropes of a ship, which, if a fly encounters, it is immediately precipitated into the web below. It preys even on bees, but the larger ants are its favourite victims, and the web is generally placed near their nests.

4. *Aranea redimita*. The abdomen oblong, ovate, and yellow, with an oval red ring on the back.

*Inhabits Europe.* B.

Of middle size; found in gardens.

5. *Aranea montana*. The abdomen ovate and white, with ash-coloured spots.

*Inhabits Europe.* B.

ARANEA.

A large species, and makes a large web, with an arched abode close adjoining for itself; it feeds not only on flies, but on small beetles and the Phalangium Opilio.

6. *Aranea Carnifex*. Ferruginous, the abdomen cinereous, with a brown line on the back.

*Inhabits* England.

7. *Aranea aquatica*. Brown; the abdomen ovate and cinereous; the back brown, with two sunk dots.

*Inhabits* Europe. B.

Among the largest of the British species; found in fresh waters, in which it dives; it passes the winter in shells, which it closes with a net.

\* *Eyes arranged thus* : :: :

8. *Aranea domestica*. The house-spider. Abdomen ovate and brown; with five black spots somewhat close together; the foremost larger than the others.

*Inhabits* Europe. B.

Frequent in houses and windows.

9. *Aranea viatica*. Abdomen nearly round, flat, and obtuse, the four hind feet the shortest.

*Inhabits* Europe. B.

Found in gardens, trees, &c. it carries the bag with its eggs always under its breast as if it were incubating.

\* *Eyes thus*, ::::

10. *Aranea globosa*. Black; the abdomen blood-red at the sides.

*Inhabits* Europe. B.

Found in woods in May and June.

\* *Eyes thus* ::::

11. *Aranea faccata*. Abdomen ovate; ferrugineous brown.

*Inhabits* Europe. B.

Among the larger species; found in gardens and meadows about the beginning of June. The female never leaves the bag which contains the eggs, even when she falls out upon her prey. Lister says it is the young of this species which, in autumn, produce that immense quantity of threads which we see in the air, and on newly ploughed land.

*Eyes*

## ARANEA.

\* *Eyes thus*, :::

12. *Aranea extensa*. Abdomen long, and of a greenish silvery colour; the feet extended longitudinally.

*Inhabits* Europe. B.

Found in moist and woody places, adhering closely to branches by the feet. It makes a web, which is of a long shape, in which it even takes the gad-fly

13. *Aranea latens*. Black; the abdomen somewhat ash-coloured, with a black interrupted dorsal line.

*Inhabits* England.

It lies hid in a small web on the upper surface of a leaf.

\* *Eyes thus*, :::

14. *Aranea dorsalis*. Black; thorax with a white line on the back.

*Inhabits* England.

A small species; the abdomen ovate; a little whitish at the base.

15. *Aranea Tarantula*. The back of the abdomen with black three cornered spots; the feet with black dots.

*Inhabits* the South of Europe. B.

This is the famous Tarantula whose bite is said to be cured by music. It is probable they have, in general, been hypochondriacal or hysterical patients who have been thus cured; or, perhaps, compassionate and credulous travellers have been imposed upon by needy or crafty people.

16. *Aranea scenica*. Black, with three semicircular white striae:

*Inhabits* Europe. B.

This species springs upon its prey without making any web: it lies concealed in the holes of walls: likewise found in woods: it comes abroad so early as February.

*Eyes thus* :::

17. *Aranea avicularia*. Thorax obicular and convex; the centre excavated transversely.

*Inhabits* America. B.

The largest of the genus, being sometimes as large as a child's fist; a frightful looking animal which not only seizes insects but even humming birds on their nests.

Web

ARANEA.

\*\* *With six eyes, thus* . . .

18. *Aranea fenoculata*. Abdomen greenish ; yellow at the sides.

*Inhabits* Europe. B.

Large and hairy ; found in gardens and on the bark of knotty trees ; in winter it lies hid in a white web.

\*\* *Eyes thus* . . . . .

19. *Aranea holosericea*. The abdomen oblong-ovate, and covered with short silky down at the base ; underneath two yellow dots.

*Inhabits* Europe. B.

Found on plants and trees rolling up the leaves to deposit its eggs. It makes a black and pretty thick and strong web.

**GEN. CXVI. SCORPIO.** Feet eight, besides two chelæ at the head. Eyes eight ; three on each side of the thorax, two on the back. Two porrected palpi with chelæ at the ends. Lip bifid. No antennæ. Tail elongated, jointed and terminated by a sharp point. Two Pectens underneath between the breast and the abdomen.

The animals of this genus live on insects and the vermes ; the larvæ and pupæ resemble the perfect insects ; they renew their covering once a year. The European species is perfectly harmless, but the large natives of Africa are undoubtedly venomous ; they strike with their tail and discharge a poison into the wound. In California, one species (the *americanus*) is eaten by the inhabitants.

*Scorpio europæus*. The Scorpion. With eighteen teeth in the pecten ; the legs with chelæ angulated. (Plate vii. fig. 23, 24.)

*Inhabits* Europe.

Found in the Southern parts of Europe ; the number of teeth in the pecten differs ; it is viviparous.

GEN. CXVII. CANCER. Feet eight, (rarely six or ten) besides two feet with claws (chelæ). Six unequal palpi. Two eyes at a distance from each other, in most species supported on a pedicle, elongated and moveable. The mandible horny and thick; the lip triple.

The insects of this genus have their whole body covered with a hard crust; in general they live in the sea; some of them in fresh waters, and some at times come upon land where they live for a month before they return. They feed on other insects, on frogs and small fishes, sometimes on carcases; the Gammari on aquatic plants. They annually cast their crust, a process which takes time and seems to be attended with pain; at this time likewise, there are found in the stomach certain calcareous concretions, vulgarly called crabs eyes. They have a power of re-producing their claws and toes when they have been broken off; the female carries her ova under her tail, which for that purpose is much broader than in the male. The genus is numerous and of various figure; it is therefore divided into the following sections.

*\*\* With four antennæ.*

- A. The last articulation bifid, the tail short.
  - a. The thorax smooth.
    - a. Intire on the sides.
    - b. Incisures on the sides.
  - b. The thorax rough or spiny above.
- B. Antennæ pedunculated; the last articulation of the hind ones only bifid; the tail long and without plates. *Pagurus.*
- C. Antennæ pedunculated; the hinder part cleft; tail long.
  - a. The crust of the thorax large enough to cover it. *Astacus.*
    - a. The posterior antennæ bifid.
    - b. The posterior Antennæ trifid.
  - b. The crust of the thorax very short, and not large enough to cover it. *Squilla.*
- D. Antennæ

**CANCER.**

D. Antennæ pedunculated and quite simple.

*Gammarus.*

\*\* *With Two Antennæ.*

A. Two arched scales instead of the hind Antennæ.

*Scyllarus.*

B. No scales, antennæ ciliated with thick hairs.

*Hippa.*

\* *With four Antennæ, A. a. a.*

1. **Cancer Pifum.** The thorax obicular and obtuse ; the tail as broad as the body.

*Inhabits the Mediterranean and British Seas.*

The size of a pea ; the tail very obtuse ; the feet smooth, not spiny, with an acute unguis, the claws somewhat oblong ; the toes equal.

2. **Cancer hexapus.** Thorax orbicular ; with only six feet ; the antennæ longer than the body.

*Inhabits Europe. B.*

The thorax is trifid between the eyes ; the middle lacinia emarginated ; the claws smooth. Is not this the *platyscheles* of Pennant, British Zoology, sp. 12.?

3. **Cancer minutus.** The thorax somewhat square, with an acute margin ; the feet compressed.

*Inhabits the Ocean, B.*

Found on the *Fucus natans*, often running on the surface of the water.

4. **Cancer Pinnotheres.** Very smooth, the thorax somewhat flat anteriorly on the sides, the tail carinated with knobs in the middle.

*Inhabits the Asiatic Seas.*

It resides within the shells of the Pinna, or rather harbours in its beard. The antients supposed that this was a friendly connection, formed for mutual defence ; that the Pinna being destitute of eyes, and thus exposed when he opened his shell to the attacks of the cuttle fish and other enemies, was warned of their approach by a prick from his little tenant, on which he immediately shut his shell, and both were safe.



## CANCER.

5. *Cancer ruricola*. The Land Crab. The first joint of the feet spiny; the second and third with little hairy tufts.

*Inhabits* South America.

This species resides in the woods, and in the Bahama islands, they are so numerous that the ground seems to move as they crawl about. In breeding time they generally make to the sea shores, for the purpose of depositing their eggs in the sand; and no obstruction will make them turn aside from the straight road. They are esteemed very excellent food; they live on vegetables; but when they have fed on the Manchineel apple, they are poisonous. When taken they will seize the persons finger with their claw, and endeavour to escape leaving the claw behind, which, for the space of a minute, continues to squeeze the finger closely. They vary in size and in colour, the light coloured being esteemed the best food.

6. *Cancer longicornis*. Thorax orbicular, less than the claws; antennæ very long.

*Inhabits* the European and Southern Ocean. B.

\* A. a b. *Incisures on the sides of the thorax.*

7. *Cancer angulatus*. Thorax bidentated on both sides; the clawed feet very long.

*Inhabits* the British Ocean.

Found near Weymouth; the clawed feet three times longer than the body.

8. *Cancer Mœnas*. Thorax nearly smooth with five incisures on each side; the carpi with one dent.

*Inhabits* the European Ocean. B.

It lurks under the algæ or burrows in the sand. Is sold and commonly eaten by the poor in London.

9. *Cancer pygmaeus*. Thorax nearly smooth with five incisures on each side, the front quite entire; the carpi with one dent.

*Inhabits* the British Ocean.

Like the *Mœnas*, but minute; the clawed feet smooth; the toes not spiny.

10. *Cancer Depurator*. The thorax with five incisures on each side; the clawed feet compressed at the apex; the hinder feet ovate.

*Inhabits* the European Ocean. B.

The

CANCER.

The front between the eyes tridentated; the finger of the clawed feet fixed and much compressed; the apex of the posterior toes ovate and membranaceous. The latipes of Pennant is a variety of this species; perhaps so likewise is his *velutinus*.

11. Cancer *Pagurus*. Common Crab. Thorax on each side with nine notches; the claws black at the tips.

*Inhabits* the European and Indian Oceans. B.

This is the Crab most commonly eaten in these islands; they are in season in harvest, and cast their shells between Christmas and Easter.

\* A. b. *Thorax rough or spiny above*.

12. Cancer *Araneus*. Thorax rough, ovate, and tuberculated, rostrum bifid; the claws ovate.

*Inhabits* Europe. B.

The fishermen suppose this species injurious to the beds of oysters, and therefore when they dredge it up they do not throw it back into the sea, but bring it ashore to destroy it. It is often covered with a byssus.

13. Cancer *hirtellus*. Thorax rough, with five dents on each side; the claws muricated on the outside.

*Inhabits* the Northern Ocean. B.

Found beneath stones.

14. Cancer *Scorpio*. The thorax pubescent, with four erect spines, the first pair of feet the longest.

*Inhabits* Europe. B.

This is the Cancer Phalangium of Pennant. It is found on the coast of Anglesea. The legs are very slender.

15. Cancer *horridus*. The thorax set with spines, the claws ovate, the tail carious.

*Inhabits* the Asiatic and Norwegian Oceans. B.

A large species; found among the rocks on the east coast of Scotland; the legs and claws are covered with spines.

\* B. *Parasitic*.

16. Cancer *Bernhardus*. With heart-shaped muricated claws, the right one the largest.

*Inhabits* the European Ocean. B.

This species being deprived of the strong covering behind,

## CANCER.

which nature has bestowed on most of the genus, takes refuge in the deserted univalve shells of the Testacea. As it grows in bulk it changes its small habitation for a larger: its tail, which is naked and tender, is furnished with a hook by which it secures itself in its lodging, and carries it about with it as it prowls for its prey.

17. *Cancer araneiformis*. The claws rough, the tail callosous at the apex, and armed with ungues.

*Inhabits* the fissures of the sea-rocks about Edinburgh.

A small species; inhabiting the shells of a *Nerita* or *Turbo*. On the margin, above the eyes, are two small spines; the claws are ovate and rough.

18. *Cancer strigosus*. The fore part of the thorax wrinkled and ciliated with spines; the rostrum acute with seven dents.

*Inhabits* the European Ocean. B.

Found on the coasts of Anglesea under stones and fuci; is very active, and when taken flaps its tail against the body with much violence and noise.

19. *Cancer rugosus*. Thorax rough, ciliated on the fore part and spiny; the rostrum with three dents; the claws very long and filiform.

*Inhabits* the Mediterranean and Scottish Seas.

This is the *Banffius* of Pennant; the *brachiatus* of Dr. Shaw. It is remarkable for the length of its arms, and for its finely ferrated thorax. It is found on the shore of Banff in Scotland.

20. *Cancer corrugatus*. Thorax quinque-dentated, serrated; body wrinkled transversely; claws furnished with a spine on the first and second joint; fangs ferrated; last pair of legs ovated.

*Inhabits* the shores of Skie, opposite to Loch Jurn.

Given from Pennant. Brit. Zool. IV. spec. 9.

21. *Cancer Tetraodon*. With a quadrifurcated snout, the two middle spines the longest; thorax spiny, body heart-shaped and uneven; claws long; legs slender.

*Inhabits* the Isle of Wight.

Brit. Zool. IV. spec. 15.

22. *Cancer*

CANCER.

22. *Cancer Dorsetensis*. With a cordated body, rugged and bent, with a few spines; very thick and long claws, and very slender legs, the first pair much longer than the rest.

*Inhabits* Weymouth.

Brit. Zool. IV. sp. 18.

23. *Cancer tuberosus*. With a tuberos, smooth back; small claws and short legs; snout slightly bifid.

*Inhabits* England.

Brit. Zool. IV. sp. 19.

24. *Cancer asper*. With a cordated body; bifid snout, legs and claws short; those of the body rough and spiny.

*Inhabits* England.

Brit. Zool. IV. sp. 20.

\* C. a. a. *The posterior antennæ bifid.*

25. *Cancer Gammarus*. The Lobster. Thorax smooth, sides of the rostrum dentated, with a double tooth at the base above.

*Inhabits* the Ocean. B.

Well known as one of the most delicate of the genus for the table. Lobsters frequent the rocky shores, especially where there is clear deep water. They are taken in wicker baskets, resembling a wire mouse-trap, which admits the animal, but prevents his return. They breed in the summer months, depositing their eggs in the sand, to the number of from 12 to 20,000. They change their crust annually, and can renew their claws and feet, if, by accident, they are torn off. Lobsters dread thunder, and are apt to cast their claws on a loud clap. They are in season from October to May. They should be chosen heavy, with the shells on their sides so hard as not to yield to moderate pressure.

26. *Cancer Astacus*. Craw-fish. Thorax smooth, sides of the rostrum dentated, with a single tooth at the base on each side.

*Inhabits* Europe. B.

This species inhabits lakes and rivers; is good eating, and turns red when boiled.

27. *Cancer Homarus*. The thorax spiny on the fore part, the

**CANCER.**

the front armed with two long spines; the claws with only one finger.

*Inhabits* the Asiatic and American Oceans. B.

This species is variegated with white spots, the antennæ are spiny on the fore part, the spines red at the apex, the extremities of the feet hairy. Found on the rocky coasts of this kingdom.

\* C. a. b. *The posterior antennæ trifid.*

28. **Cancer Squilla.** Thorax smooth, rostrum ferrated above, tridentated below, the margin of the thorax with five dents.

*Inhabits* the European Ocean. B.

Sold in London under the name of the white Shrimp, as it assumes that colour when boiled; the *ferratus* of Pennant, the Prawn, is a variety of this species.

29. **Cancer Crangon.** The Shrimp. Thorax smooth; rostrum short and entire; the thumb of the claw longer than the finger.

*Inhabits* the Northern Seas. B.

Found on all the sandy shores of Britain in great plenty: the most delicious of the genus.

30. **Cancer norvegicus.** Thorax aculeated on the fore part; the claws angular; the angles spiny.

*Inhabits* the Norwegian Sea.

Found in different parts on the coast of England, and in the north of Scotland.

\* D. *Antennæ pedunculated and simple.*

31. **Cancer grossipes.** The claws want the finger; the antennæ the length of the body; the tail obtuse.

*Inhabits* the European Ocean. B.

The *linearis* of Pennant. Found in the sand on the shore of Flintshire and other places.

32. **Cancer Pulex.** With four claws which want the finger; ten feet.

*Inhabits* Europe. B.

This species is very frequent on the shores of the sea; likewise in fountains and rivulets; it swims on its back, and leaps; it causes ulcers on the gills of fishes, and destroys the nets of fishermen; it is eaten by the Avoletta; it shines in the night.

33. **Cancer**

CANCER.

33. Cancer *Locusta*. With four claws, which want the finger; fourteen feet; the thighs simple.

*Inhabits* Europe. B.

Found very frequently on the sea shore; also in fountains and ditches, swimming on its back, and leaping.

34. Cancer *Atomos*. Linear; the claws wanting the finger; with eleven feet.

*Inhabits* Europe. B.

Found in fresh waters; hardly visible by the naked eye; a slender tail between the last pair of feet, makes the eleventh foot; in the middle two pair of oval vesiculæ.

35. Cancer *lobatus*. Linear; four claws wanting the finger; ten feet.

*Inhabits* Europe. B.

This is the *Squilla lobata* of Muller's *Zoologia Danica*; it is found among the conservæ on the sea-shore at Leith; but, perhaps, is not really different from the preceding species.

36. Cancer *salinus*. Claws wanting the finger; twenty spreading feet; the tail subulated.

*Inhabits* England.

Found in the salt pans at Limington, and in the salt lakes of Siberia.

37. Cancer *stagnalis*. Claws wanting the finger; the feet spreading; the tail cylindrical and bifid.

*Inhabits* Europe. B.

Found in stagnant waters.

\*\* A. Two arched scales instead of the hind antennæ.

38. Cancer *Arctus*. The scales of the antennæ ciliated with prickles.

*Inhabits* Europe, &c. B.

Found in Mounts-bay, Cornwall; the body and tail flat and broad.

39. Cancer *Symnista*. The thorax with four dents on each side; the hands with chelæ.

*Inhabits* Europe. B.

The *Cassivelaunus* of Pennant. Found near Holyhead and Red Wharf, Anglesea, in deep water, where it is dredged up.

## CANCER.

40. Cancer *Mantis*. With short antennæ; short thorax, and two pinnated substances on each side; three pair of claws with hairy ends; the body long, divided by eight segments; two fins on each side of the tail; tail conoid, with spines on the margin.  
*Inhabits* England.

GEN. CXVIII. MONOCULUS. Feet formed for swimming, very long, from four to eight; body covered with a crust, elongated, and attenuated behind; the segments from five to ten. Antennæ two; those of the male thicker and shorter; in some species wanting. One eye or two very close together. Four palpi in continual motion when the animal swims; the hinder ones very small and hook-shaped.

The insects of this genus live in water, chiefly stagnant waters; they cast their crust; some are viviparous, some oviparous, and some generate in both ways.

\* *With one eye.*

1. Monoculus *quadricornis*. Tail straight and bifid.  
*Inhabits* Europe. B.

Found in fresh waters, and frequent even in the purest. When viewed with a high magnifier, it is found to have two eyes placed close together; it is very minute, but may sometimes be distinguished even with the naked eye; it has four antennæ.

2. Monoculus *rubens*. Red; the tail straight and bifurcated.

*Inhabits* Europe. B.

Found in marshes, lakes, and rivulets; it has two antennæ almost as long as the body; eight feet.

3. Monoculus *Pulex*. Crust pointed behind.

*Inhabits* Europe. B.

Found plentifully in stagnant waters, and is a frequent cause of their red colour; it has ten feet; it has a large square spot on the back, like a saddle.

4 Monoculus

**MONOCULUS .**

4. *Monoculus longispinus*. Crust ferrated before; aculeated behind.

*Inhabits* Europe. B.

Found in pure waters; chiefly in July and August; it has eight feet.

5. *Monoculus finus*. Crust oval and without spine.

*Inhabits* Europe. B.

Found during the whole summer in marshes; the crust is yellowish and pellucid; the feet eight.

6. *Monoculus conchaceus*. Crust oval and tomentose.

*Inhabits* Europe. B.

Found in the purer sort of stagnant waters; the antennæ white or yellowish and exserted; swims swiftly with ten setæ; green, opaque, feet yellowish, abdomen nearly bilobed and orange coloured; resembles a muscle in miniature, being about the size of a grain of sand, but sometimes nearly the tenth of an inch long.

7. *Monoculus Satyrus*. Crust oval; antennæ obtuse, and extended vertically.

*Inhabits* Europe. B.

Found in pure waters; pellucid; crust flat and membranaceous; antennæ rigid; with three very short setæ at the apex: the feet thick before, and bifid; the tail truncated, cleft in the middle.

\*\* *With two eyes.*

8. *Monoculus Delphinus*. With eight feet; two eyes.

*Inhabits* Europe. B.

Found in running streams.

9. *Monoculus Polyphemus*. Crust orbicular; the suture lunated in the middle; the tail subulated and three sided.

*Inhabits* India and America.

The largest of insects, sometimes four feet long; it has seven pair of feet.

10. *Monoculus Apus*. Crust oblong; the suture lunated before; the tail with two setæ.

*Inhabits* Europe. B.

Found in ditches, ponds, &c. and though dried in summer, when the water has evaporated, yet they revive when it returns. This is the largest of the British species.

11 *Monoculus*



## MONOCULUS.

11. *Monoculus piscinus*. Body short; tail bifid, with one plate.

*Inhabits* Europe. B.

Found on Flounders, Cod-fish, Salmon, &c. adhering on the outside between the scales; running swiftly both on the fish and in the water.

GEN. CXIX. ONISCUS. Maxilla truncated and denticulated. Lip bifid. Palpi unequal, the hind ones the longest. Antennæ setaceous. Body oval. Fourteen feet.

The insects of this genus live on the leaves of plants, on filth, and the juices of animals; they change their skins, which are composed of several crustaceous plates. They are frequently found in houses, gardens, and woods, and some species live in the water.

1. *Oniscus Asilus*. The abdomen covered with two folioli; the tail semi-oval.

*Inhabits* Europe and India. B.

Found in the sea; it is viviparous and a great plague to fish.

2. *Oniscus Oestrum*. Abdomen covered with six plates; the tail hollowed.

*Inhabits* Europe. B.

3. *Oniscus Entomon*. Four antennæ; tail oblong and acute.

*Inhabits* Europe. B.

Swims swiftly in the sea; feeds on crabs and fishes; detected by fishermen.

4. *Oniscus marinus*. Semicylindrical; the tail ovate-oblong and acuminate.

*Inhabits* Europe. B.

5. *Oniscus aquaticus*. Tail rounded, with two bifurcated appendices; four antennæ.

*Inhabits* Europe. B.

Found in fresh waters; the young are inclosed in a bag, which the mother carries under her belly, with six clefts in it.

ONISCUS.

1. *Oniscus oceanicus*. Oval; tail bifid, with bifid appendices.

*Inhabits* Europe. B.

Found in the sea; akin to the *Afellus*.

2. *Oniscus affinis*. Oval, tail obtuse, without appendices; body cinereous.

*Inhabits* Europe. B.

Found in the sea on fuci.

3. *Oniscus Afellus*. Oval; the tail obtuse, with two simple appendices.

A very common insect; found in houses, walls, green-houses, putrid wood, &c. the young are inclosed in a follicle of four valves on the abdomen of the mother.

4. *Oniscus Armadillo*. Oval, of a brownish ash-colour; the tail obtuse and intire.

*Inhabits* Europe. B.

Found under stones; when touched it rolls itself up into a hard motionless ball.

5. *Oniscus bidentatus*. The abdomen naked; the tail very obtuse, the last scale bidentated.

*Inhabits* England.

Found at Milford Haven. Length half an inch; upper side marked with six transverse rows of ochreous spots; scales seven, the last with two teeth, which readily distinguishes this species. Given from the Linnæan Transactions, Vol. V. p. 8.

GEN. CXX. SCOLOPENDRA. Antennæ setaceous; palpi two, filiform, and articulated, united between the maxillæ. Lip dentated and cleft; body depressed. Feet numerous; as many on each side as there are segments in the body.

The insects of this genus, in all their stages, live on other insects; the larvæ have fewer feet than the perfect insect; in other respects very like it, as are also the pupæ. In India and America, some of the species of this genus grow to about a foot in length, and an inch and a half in girth.

## SCOLOPENDRA.

1. *Scolopendra lagura*. Twelve feet on each side ; body oval, tail furnished with a white pencil.

*Inhabits* Europe. B.

Found among mosses.

2. *Scolopendra forficata*. Feet, on each side, fifteen.

*Inhabits* Europe. B.

A very common species, found under stones and in damp places.

3. *Scolopendra electrica*. Feet, on each side, 70 ; the body linear.

*Inhabits* Europe. B.

Found in close places, and shines in the dark.

4. *Scolopendra microscopica*. Pellucid and punctated, with a lateral margin ; a stripe along the back and forked tail, gold coloured.

Given from the Naturalists Miscellany, 1794, Plate 185. found in May in the water of a soft pond ; it is entirely microscopic ; its motion slow, but accompanied with great freedom.

GEN. CXXI. JULUS. Antennæ moniliform. Palpi two filiform and articulated. Body semi-cylindrical. Feet numerous, two on each side for every segment of the body.

The Juli live on other insects particularly on Acari, the larvæ and pupæ have many feet, and are like the perfect insect.

1. *Julus terrestris*. An hundred feet on each side.

*Inhabits* Europe. B.

Found in woods upon the ground, or under stones.

2. *Julus complanatus*. Thirty feet on each side, the body somewhat flat.

*Inhabits* Europe. B.

3. *Julus sabulosus*. One hundred and twenty feet on each side.

*Inhabits* Europe. B.

Found in sandy places ; among hazles ; double the size of the *terrestris*.

4. *Julius*

**JULUS.**

4. *Julus oniscoides*. About 18 feet on each side ; the breadth one third of the length.

*Inhabits* Europe. B.

Given from Townson's Tracts, p. 151. Found in the neighbourhood of Edinburgh in moist places, under loose stones ; like the *Oniscus Armadillo*.

§ 263.

Insects are preserved in Cabinets, being stuck through the thorax on pins, the pin fixed in cork or wax.

§ 264.

In collecting insects, both male and female ought if possible to be procured ; and the time of the year when they are taken ought to be noted. Specimens with injured wings or antennæ must be rejected.

For collecting insects in their perfect state, gauze nets are in use, and a sort of forceps, the extremities forming a circle covered with gauze. Besides these the Entomologist, in his walks, should be furnished with a pin-cushion, stored with pins of various sizes, and a tin box lined with cork, of a convenient size for the pocket, in which the insects when caught are to be placed ; the lepidopterous insects being first carefully killed by squeezing their thorax, lest their fluttering should injure their wings. Coleopterous insects are most expeditiously killed by being immersed in boiling water ; and those who chuse this method may carry them home without injury in common pill-boxes. Most insects are killed by a few drops of spirit of turpentine ; the lepidoptera and hymenoptera, may easily be killed by being stuck through with a pin dipt in aqua fortis. When the insects are killed they are to be transfixed with pins, their wings, antennæ and feet spread out and kept displayed. In some of the Lepidoptera, two specimens should be preserved, the wings in the one displayed, in the other placed as much as possible, in their natural position when the insect is at rest.

Insects may likewise be collected by breeding them from their larvæ ; and this, when it is convenient, is by far

far the best method for procuring fine specimens; it is chiefly practised with the lepidopterous kinds. When the caterpillars are taken they are to be fed on the leaves of the plant or tree on which they were found, and kept in a box with some moist earth at the bottom; they will afterwards turn into a chrysalis, either by going into the earth, by spinning a web and inclosing themselves in it, or by changing into a Pupa *obscuta*, according to their kinds. Having continued in this state their appointed time, the perfect insect will come forth, and must then be killed before it has injured its wings by flying.

Lepidopterous insects are likewise to be collected in their pupa state, by seeking for them under the projections of garden-walls, pales, out-houses, summer-houses, &c. or by digging for them in the winter months under the trees they feed on. When thus dug up they are to be put in a box with moist earth and kept till they come out.

#### § 265.

When the insects are prepared in this manner, they are to be placed in the cabinet, which may consist of boxes or drawers deep enough to hold a long pin, and lined on the bottom with cork, or with wax\*; the insects of each order in drawers by themselves, and the different genera close together. The generic and trivial name of each insect, is to be written on a piece of paper, fixed to the bottom by the same pin which supports the insect. The drawers must be made to shut very close, so as to exclude the dust and minute insects; and some cover them with glass. A little camphor in each drawer is likewise useful.

Insects

\* For large drawers or boxes the following composition is better than Cork. Take ten ounces of yellow rosin; six ounces of yellow wax; two ounces of tallow and one ounce of turpentine; melt these together over a fire, and when they are well melted and mixed, set your box or drawer upon a table or other place which is perfectly horizontal, then pour the mixture gently into the box, so as to cover the bottom about the tenth of an inch. Before it cools cover it completely with white paper previously prepared.

Is of the Aptera order such as Spiders, Scolopenduli, &c. are best preserved in some kind of spirits. nisci and Cancri may be preserved like beetles.

SYNOPSIS OF BRITISH GENERA.

I. COLEOPTERA.

\* *Antenna clavated, thick at the extremity.*

a. The clava lamellated.

ABUS. The anterior tibiæ dentated.

PS. Two pencils under the lip, bearing the palpi.

b. The clava perfoliated.

STES. Head inflected under the thorax, which is scarcely margined.

JS. Lip porrected and bifid.

Thorax and elytra margined.

PHILUS. The maxilla bifid.

c. The clava solid.

. The head retractile within the thorax.

CHUS. Head inflected under the thorax, which is scarcely margined.

ENUS. The maxilla bifid.

JLA. The thorax and elytra margined.

ELIA. The anterior palpi securiform, the hind ones filiform.

LIO. The rostrum elongated and horny.

\*\* *Antenna moniliform.*

ABUS. The rostrum elongated and incurved.

CLINUS. Elytra half the length of the abdomen, covering the wings. Two vesicles, above the tail, which can be thrust out.

. Thorax roundish, head gibbous and inflected.

RIO. Thorax margined; head exserted; body oblong.

A. Body ovate, elytra margined, head covered with a clypeus.

UM. The thorax and elytra margined.

ILLA. Laminæ at the base of the abdomen, the head inflected.

OMFLA. Body ovate, not margined.

. Palpi unequal, maxilla bifid, lip rounded.

\*\*\* *Antennæ*

\*\*\* *Antennæ filiform.*

- PIMELIA.** Thorax marginated, head exerted, body oblong.  
**GYRINUS.** Antennæ somewhat rigid; four eyes.  
**CRYPTOCEPHALUS.** Body ovate, not marginated.  
**BRUCHUS.** Antennæ thickest at the extremities.  
**PTINUS.** Thorax receiving the head; the last articulations of the antennæ the longest.  
**HISPA.** Antennæ porrected, close, and fusiform.  
**BUPRESTIS.** Head half withdrawn within the thorax.  
**NECYDALIS.** Elytra half the length of the abdomen, the wings naked.  
**LAMPYRIS.** Elytra flexible; the clypeus of the thorax covering the head and receiving it.  
**CANTHARIS.** Elytra flexible; the abdomen with folded papillæ at the sides.  
**NOTOXUS.** Lip bifid, the lacinia meeting and obtuse.  
**ELATER.** Leaping by means of a spine in the breast.  
**CARABUS.** Thorax obcordated, truncated behind.  
**LYTTA.** Thorax roundish, head gibbous and inflected.

\*\*\* *Antennæ setaceous.*

- CERAMBYX.** Thorax at the sides spinous or gibbous.  
**LEPTURA.** Elytra attenuated at the apex; thorax somewhat cylindrical.  
**CICINDELA.** Maxillæ exerted, dentated; eyes prominent.  
**DYTISCUS.** Hind legs ciliated, formed for swimming.  
**FORFICULA.** Elytra half covering the abdomen; the wings covered; the tail armed with a forceps.

## II. HEMIPTERA.

- BLATTA.** Mouth with maxillæ; wings coriaceous and flat; the hind legs formed for running.  
**GRYLLUS.** Mouth with maxillæ; the hind legs formed for leaping.  
**CICADA.** With an inflected rostrum; the hind legs formed for leaping.  
**NOTONECTA.** With an inflected rostrum; the hind feet ciliated, formed for swimming.  
**NEPA.** With an inflected rostrum; the fore feet furnished with chelæ.  
**CIMEX.** With an inflected rostrum; the feet formed for running; the antennæ longer than the thorax.  
**APHIS.** With an inflected rostrum, and two horns on the abdomen.

- CORFES.** A rostrum rising from the breast; the hind legs formed for leaping.
- COCCUS.** A rostrum rising from the breast; the abdomen of the male with bristles behind
- THRIPS.** With an obsolete rostrum; wings incumbent on the abdomen.

## III. LEPIDOPTERA.

- PAPILIO.** Antennæ knobbed at the extremity; wings erect.
- SPHINX.** Antennæ thickest in the middle.
- PHALENA.** Antennæ setaceous.

## IV. NEUROPTERA.

- LIBELLULA.** Tail with a forceps; mouth with more maxillæ than two; wings extended, not covering one another.
- EPHEMERA.** Tail with two or three setæ; mouth without teeth; wings erect.
- MYRMELEON.** Tail with a forceps; mouth bidentated; wings deflected.
- PHYRGANEA.** Tail simple; mouth without teeth; wings deflected.
- HEMEROBIUS.** Tail simple; mouth bidentated; wings deflected.
- PANORPA.** Tail with a chela; mouth with a rostrum; wings incumbent.
- RAPHIDIA.** Tail with a single seta; mouth bidentated; wings deflected.

## V. HEMENOPTERA.

- CYNIPS.** With a spiral aculeus.
- TANTHREDO.** With a ferrated bivalve aculeus.
- SIREX.** With a ferrated aculeus, under a spine terminating the abdomen.
- ICHNEUMON.** With an exerted, triple aculeus.
- SPHEX.** With a sting; wings flat; tongue inflected and trifid.
- TIPHIA.** With a thick, horny, tridentated lip.
- CHALCIS.** Antennæ short, cylindrical, and fusiform.
- CHRYISIS.** With a sting; the abdomen arched below.
- VESPA.** With a sting; folds in the upper wings.
- APIS.** With a sting; the tongue inflected.
- FORMICA.** With a blunt aculeus; the neuters without wings.
- MUTILLA.** With a sting; the neuters without wings.

## VI.



## VI. DIPTERA.

\* *With a proboscis and haustellum.*

**TIPULA.** The haustellum without a vagina; two porrected, filiform palpi.

**MUSCA.** The haustellum without a vagina, furnished with setæ.

**TABANUS.** The haustellum with an univalve vagina, and furnished with setæ.

**EMPIS.** The proboscis inflected.

**CONOPS.** The proboscis porrected and geniculated.

\*\* *With a haustellum, but no proboscis.*

**OESTRUS.** The haustellum retracted within the lips, which are united, and perforated with a pore.

**ASILUS.** The haustellum straight, bivalve, gibbous at the base.

**STOMOXYS.** The haustellum with an univalve convoluted vagina, geniculated at the base.

**CULEX.** With an univalve, exerted, flexible vagina; five setæ.

**BOMBYLIUS.** The haustellum very long, straight, setaceous and bivalve.

**HIPPOMOSCA.** The haustellum short, cylindrical, straight, bivalve.

## VII. APTERA.

\* *With six feet; the head distinct from the thorax.*

**LEPISMA.** The tail with extended setæ.

**PODURA.** The tail bifurcated, inflected, formed for leaping.

**TRIMES.** Mouth with two maxillæ; a horny quadrifid lip.

**PEDICULUS.** Mouth with an aculeus that can be exerted.

**PULEX.** Mouth with an inflected rostrum, and an aculeus; the feet formed for leaping.

*Feet from 8 to 14: the head and thorax united.*

**ACARUS.** Eyes 2, feet 8, the palpi compressed.

**HYDRACHNA.** Eyes from 2 to 8. Feet 8 on the anterior part of the body; papillæ for spinning threads.

**ARANEA.** Eyes 8, feet 8; papillæ for spinning a web; palpi clavated.

**PHALANGIUM.** Eyes 4, feet 8, palpi with chelæ.

**CANCER.** Eyes 2, feet 10, the first pair with chelæ.

**MONOCULUS.** Eyes 2, feet 12, ten with chelæ.

**ONISCUS.** Eyes 2, feet 14.

\*\*\* *Many feet, the head distinct from the thorax.*

**SCOLOPENDRA.** The body linear.

**ILUS.** The body nearly cylindrical.

## CHAP. VIII.

OF

## HELMINTHOLOGY.

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§ 266.

**HELMINTHOLOGY** \* treats of the VERMES, or of those animals that are furnished with a white and cold sanies, instead of blood; and whose heart, when they have one, consists but of a ventricle, (Plate I. fig. 5.) They differ from insects in never undergoing any metamorphosis; and, from all other animals, in being able to repair even their essential parts when lost or destroyed, (§ 46); in being, for the most part, either hermaphrodites, or destitute of sex; and, without any visible organs of generation, propagating their offspring. Some of them are oviparous, others viviparous. In some, however, such as the *Ascaris trichiura*, and the *Cucullanus*, a distinction of sex has been observed. In general the Vermes have a much more simple organization than the other animals; they are destitute of true bones; but the soft parts of the *Asterias* and *Pennatula*, are supported by others of a firmer texture, and many Vermes have a crustaceous covering. Their bodies, in general, can be extended and contracted. But the animals of which this class consists, are very numerous, and they differ much from one another in structure and properties.

VOL. II.

R r

§ 167.

\* From *ἐλμιν*, *elmin*, a worm, and *λογία*, a discourse.

## § 267.

A head separated from the trunk by a particular member or neck, is very seldom found in the Vermes. there are, however, instances of it in the genera of *Nereis* and *Nais*; but, on the other hand, if we call that part *head*, in which the mouth and organs of sense are placed, we cannot deny that all the Vermes possess it; for the whole class take their nourishment by the mouth; and many of them, as the *Hirudo*, *Nais*, *Fasciola*, *Limax*, &c. are provided with two eyes, which resemble the stemmata of insects.

The Vermes have an organ which is peculiar to them, namely the feelers, (*tentacula*), with which most of them are furnished. These are soft and cartilaginous, and are capable of being thrust out and drawn in. Besides the true feelers, or instead of them, some Vermes have small threads or arms, that are likewise considered as organs of sense or motion; thus the *Hydra* and *Sepia* have *cirri*, the *Vorticella* *cilia*, the *Trichoda* *crines*, &c.

The number of the tentacula is different. In all the kinds of water *Limax* there are two tentacula; but in the land species there are four; in the *Nereis*, *Amphitrite*, &c. there are six, or more.

In the genera of *Limax* and *Helix*, they are filiform; in the *Nereis*, setaceous; feathered (*plumosa*), in the *Amphitrite*; annulated, in the *Aphrodita*; branching in the *Holothuria*; subulated in the *Myxine*; penicillated in some *Echini*; triangular in the *Buccinum*; truncated in the *Helix* *Carychium*; pennated in the *Serpula*; and crested in the *Tubularia*.

The eyes are placed sometimes in the points of the tentacula, as in the *Helix*; sometimes at the base of them on the outside, as in the *Bulla*; or on the inside, as in the *Buccinum*; in the *Sepia* they are situated on the sides of the head.

The *cirri* are in the *Sepia* set with warts, (*verrucosi*), or round, (*teretes*), as in the *Lernæa*; or broad (*dilatati*), as in the *Clio*; or concentric, turning in, as in the *Hydra*; or excentric, turning out, as in the *Actinia*.

## § 268.

§ 268.

Many Vermes creep or swim in the water without feet; others have, on the sides of the body, sometimes simple, sometimes branched setæ, that serve them instead of feet.

Their abode is generally in fresh or in salt waters; though a few live on land, but always in moist places; and some live in the bodies of other animals.

§ 269.

If respiration be really necessary to the animals of this class, the function is performed in a manner very different from that in other animals. Their nourishment is simple; most of them live by suction; many eat earth, and some of them can sustain a very long fast.

§ 270.

As weapons of defence, some are provided with a poisonous juice; the Sepia with a kind of ink, and the testacea with a hard shell.

§ 271.

Their use in the economy of nature is various. The Gordius perforates clay that the water may penetrate through it; the Lumbricus terrestris the vegetable soil, to keep it porous and friable; the Terebratulidæ perforates wood, that it may be destroyed, as the Pholadæ and Mytili lithophagi do stones, that they may fall down into dust.

Many of them, the Testacea especially, afford a salutary and agreeable food to man; from a species of Murex, the famous purple of the ancients was obtained; and from the beard of a species of Pinna, various articles of dress are manufactured in the Levant. Some Mytili produce pearls. Mother of pearl, coral, sponge, &c. are all produced by the animals of this class.

§ 272.

BOOKS ON HELMINTHOLOGY.

INTESTINA, ET MOLLUSCA.

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- J. P. Breynius, De Echinis et Echinitis, sive methodica Echinorum distributio. Gedani 1732, 42.

## § 273.

The Class of Vermes is divided into five Orders, viz Intestina, Mollusca, Testacea, Zoophyta and Infusoria.

## § 274.

## § 274.

## ORDER I. INTESTINA.

THE Order of Intestina is so called, either because most of the animals it contains, reside in the intestines of other animals, or because they are long and slender, to some degree resembling a gut. They are simple, unjointed, and without limbs or members. Some live in the bodies of other animals; but a few, such as the *radiæ*, *Hirudo*, and *Planaria*, live in fresh waters; the *unculus* and *Lumbricus*, (except one species), in the

GEN. I. ASCARIS. Body long and round, elastic, and attenuated at each end; the head with three tubercles; the tail obtuse or subulatus. The vessels spiral, milk-white, and pellucid.

The insects of this genus inhabit solely the intestines of animals: in those of man two species have been found.

*Ascaris vermicularis*. Tail subulatus, the skin at the sides of the body very finely crenated.

*Inhabits* the intestines of children, even of those newly born, especially the rectum; the animal is viviparous; it does not exceed an inch in length; it is thin, white, and so smooth that, even with a glass, no rings are observable in it. It has sometimes been passed with the urine.

*Ascaris lumbricoides*. Tail obtuse, or somewhat incurved; the aperture at the tail transverse, the intestine orange coloured.

*Inhabits* the human intestines, particularly the small ones, sometimes penetrating into the pancreatic duct; it is easily distinguished from the common earth worm, for which it is generally taken, by the want of setæ, by the very slender rings round it, by its being whitish or reddish, and by being oviparous. It is also sometimes found in the stomach.

*Ascarides*

## ASCARIS.

Ascarides inhabit the intestines of quadrupeds, birds, fishes, reptiles, and even of the common earth-worm. In the following animals, which are natives of Britain, they have been found.

3. *Ascaris Vespertilionis*. The eared Bat.
4. *Ascaris Phocæ*. The Seal.
5. *Ascaris Canis*. The Dog.
6. *Ascaris visceralis*. The Dog, in the kidneys.
7. *Ascaris Vulpis*. The Fox.
8. *Ascaris Felis*. The Cat, in the stomach.
9. *Ascaris Cati*. The Cat.
10. *Ascaris Martis*. The Martin.
11. *Ascaris bronchialis*. The Martin, in the lungs.
12. *Ascaris renalis*. The Martin, in the kidneys.
13. *Ascaris Talpæ*. The Mole.
14. *Ascaris Muris*. The Mouse.
15. *Ascaris Hirci*. The Goat.
16. *Ascaris Vituli*. The Calf.
17. *Ascaris Equi*. The Horse.
18. *Ascaris Suis*. The Wild Boar.
19. *Ascaris Aquilæ*. The Golden Eagle.
20. *Ascaris Albicillæ*. The Erne.
21. *Ascaris Buteonis*. The Buzzard.
22. *Ascaris Milvi*. The Kite.
23. *Ascaris Subbuteonis*. The Hobby.
24. *Ascaris Cornicis*. The Crow.
25. *Ascaris Coraciæ*. The Roller.
26. *Ascaris Cygni*. The Swan.
27. *Ascaris Anatis*. The wild Duck.
28. *Ascaris Fuligulæ*. The tufted Duck.
29. *Ascaris Lari*. The Gull.
30. *Ascaris Ciconiæ*. The Stork.
31. *Ascaris Ta dæ*. The Bustard.
32. *Ascaris papillofa*. The Bustard, in the cæcum and rectum.
33. *Ascaris Gallopavonis*. The Peacock.
34. *Ascaris Galli*. The Chicken.
35. *Ascaris Gallinæ*. The common Hen.

36. *Ascaris*.

CARIS.

- . *Ascaris Phasiani*. The Pheasant.
- . *Ascaris Tetraonis*. The Partridge.
- . *Ascaris Columbæ*. The domestic Pigeon.
- . *Ascaris Alaudæ*. The Lark.
- . *Ascaris Turdi*. The Thrush.
- . *Ascaris Lacertæ*. The water Lizzard.
- . *Ascaris Bufonis*. The Toad.
- . *Ascaris pulmonalis*. The Toad, in the lungs.
- . *Ascaris Rubetræ*. The Toad, in the rectum.
- . *Ascaris Trachealis*. The Toad, in the lungs.
- . *Ascaris Ranæ*. The Frog, in the rectum.
- . *Ascaris intestinalis*. The Frog, in the intestines.
- . *Ascaris dyspnoos*. The Frog, in the lungs.
- . *Ascaris infons*. The Frog, in the lungs.
- . *Ascaris Anguillæ*. The Eel.
- . *Ascaris marina*. The Cod and other fishes; the  
Gordius marinus of former editions.
- . *Ascaris Blennii*. The viviparous Blenny.
- . *Ascaris Rhombus*. The Pearl.
- . *Ascaris Percae*. The Perch.
- . *Ascaris globicola*. The Banstickle.
- . *Ascaris lacustris*. The Banstickle, and the Pike.
- . *Ascaris Siluri*. The Silurus Glanis.
- . *Ascaris Farionis*. The Salmon.
- . *Ascaris Truttae*. The Salmon.
- . *Ascaris Acus*. The Pike.
- . *Ascaris Halecis*. The Herring.
- . *Ascaris Argentinae*. The Argentine.
- . *Ascaris Gobionis*. The Gudgeon.
- . *Ascaris Rajae*. The Skate.
- . *Ascaris Lophii*. The Fishing Frog.
- . *Ascaris Lumbrici*. The Earth Worm.

EN. II. TRICHOCEPHALUS. Body elastic, twisted; the posterior part thick and clavated; the anterior capillary, and double the length of the other; sometimes with a knob at the end.

The animals of this genus are gregarious and oviparous,  
and



## TRICHOCEPHALUS.

and chiefly infest the intestines of man and quadrupeds: the males are distinguished by their tails being spirally rolled up.

1. *Trichocephalus hominis*. Somewhat crenated above, smooth below; on the fore part finely striated.

*Inhabits* the human intestines.

This animal was first discovered in 1760, in the bodies of some French soldiers who died of a contagious disease; it chiefly resides in the blind gut; it is about two inches long. Other species are the *T. equi*, *muris*, *vulpis*, and *lacerte*, which are found in the intestines of the Horse, the Mole, the Fox, and the Lizard.

- GEN. III. FILARIA. Body round and filiform, equal, very smooth, the mouth dilated; the lip neatly round and concave.

The Filaria differs from the Gordius in its abode, and in its tail not being hooked. It occupies the cellular substance, seldom getting into the intestines; it has not yet been found in fishes, the amphibia, or reptiles.

1. *Filaria medinensis*. The Guiney. Entirely of a pale colour.

*Inhabits* Guinea, America, and the Southern parts of Asia.

This animal gets into the feet of slaves, and persons who walk barefooted; exciting pain and fever; it must be extracted gradually and with much caution, for if it breaks, it turns putrid in the wound, and occasions great pain. It is extracted in twenty days by a solution of corrosive sublimate in spirits; by other means it requires forty days to draw it out. Animals of this genus have been found in some quadrupeds, birds, and insects, but the different species have not been sufficiently described.

- GEN. IV. UNCINARIA. Body filiform and elastic; obscurely knobbed before; the lips membranaceous and angulated; the tail of the female needle-shaped; of the male armed with two pointed hooks inclosed in a pellucid vesicle.

There are two species of this genus, the *melis* and the *vulpis*,

**UNCINARIA.**

*rudis*, which have been found in the intestines of these animals, viz. the badger and the fox.

**GEN. V. SCOLEX.** Body gelatinous, of various figure, somewhat broad before and acuminate behind; sometimes long and linear, sometimes rough and short, round, waved or depressed, the head capable of being thrust out or drawn in.

There are two species, the *Pleuronectis*, observed in some flounders, the Guinad and Lump-fish; and the *Lophii*, found in the Fishing-frog.

**GEN. VI. LIGULA.** Body linear, equal and elongated, obtuse before, acute behind, with a sucker on the back.

There are two species, the *intestinalis*, found in some sea-birds; and the *abdominalis* found in a variety of fishes.

**GEN. VII. STRONGYLUS.** Body round, long, pellucid, smooth, before globose and truncated; with a circular aperture ciliated on the margin; behind, in the female intire and acuminate, in the male dilated into pellucid membranes, which are loose and distant.

There are two species, the *equi* found in the horse; and the *ovis* in the sheep.

**GEN. VIII. ECHINORHYNCHUS.** Body round and long, with a cylindrical, retractile, echinate proboscis.

The animals of this genus adhere closely during the whole of their life to a particular spot in the intestines of the animals they inhabit; in general they are gregarious; they have not yet been found in the human body; they are distinguished from the *Taeniae* by their body being cylindrical and not jointed, and by the immoveable naked hooks of their proboscis.

## ECHINORHYNCHUS.

is. The males are less than the females which are oviparous, and live apart in a different individual. They have been found in quadrupeds, birds, reptiles and fishes.

1. *Echinorhynchus tubifer*. In the Great Seal.
2. *Echinorhynchus Gigas*. In stall-fed Swine, sometimes a foot or a foot and a half long.
3. *Echinorhynchus Balanae*. The Whale.
4. *Echinorhynchus Buteonis*. The Buzzard.
5. *Echinorhynchus Strigis*. The Screech Owl.
6. *Echinorhynchus Pici*. The Woodpecker.
7. *Echinorhynchus borealis*. The Eider Duck.
8. *Echinorhynchus Boschadis*. The tame Duck.
9. *Echinorhynchus Anatis*. The velvet Duck.
10. *Echinorhynchus Mergi*. The Lough Diver.
11. *Echinorhynchus Alca*. The black-billed Awk.
12. *Echinorhynchus Ardeæ*. The Heron.
13. *Echinorhynchus Gazæ*. The white Heron.
14. *Echinorhynchus Vanelli*. The Lapwing.
15. *Echinorhynchus Merula*. The Blackbird.
16. *Echinorhynchus Ranae*. The Frog.
17. *Echinorhynchus Anguillæ*. The Eel.
18. *Echinorhynchus candidus*. The Cod and other fishes; sometimes three inches long.
19. *Echinorhynchus lineolatus*. The Cod; two inches long.
20. *Echinorhynchus Pleuronectis*. The Turbot.
21. *Echinorhynchus attenuatus*. The Flounder.
22. *Echinorhynchus annulatus*. The Father Lather, Cod, and Bream.
23. *Echinorhynchus Platessoidæ*. The Plaice.
24. *Echinorhynchus Perca*. The Perch.
25. *Echinorhynchus Cernuæ*. The Ruffe (Perch).
26. *Echinorhynchus Cobitidis*. The Loach.
27. *Echinorhynchus Salmonis*. The Salmon.
28. *Echinorhynchus sublobatus*. Young Salmon.
29. *Echinorhynchus quadrirostris*. Salmon; the liver.
30. *Echinorhynchus Truttae*. The Trout.
31. *Echinorhynchus Lucii*. The Pike.
32. *Echinorhynchus Argentinae*. The Argentine.
33. *Echinorhynchus*

CHINORHYNCHUS.

3. Echinorhynchus *Alofæ*. The Shad.
4. Echinorhynchus *Barbi*. The Barbel.
5. Echinorhynchus *Carpionis*. The Carp.
6. Echinorhynchus *affinis*. The Roach.
7. Echinorhynchus *Bramæ*. The Bream.
8. Echinorhynchus *Lophii*. The Fishing Frog.
9. Echinorhynchus *Sturionis*. The Sturgeon.

GEN. IX. HAERUCA. Body round ; at the anterior end two necks, surrounded with a single ring of prickles ; no proboscis.

There is but one species of this genus.  
*laeruca muris*. Wrinkled, and of a greyish white colour,  
*Inhabits* the stomach of the mouse.

GEN. X. CUCULLANUS. Body acuminated behind, obtuse before ; the mouth obicular ; with a striated hood.

The Cucullani are in general viviparous, and found chiefly in the intestines of fishes.

Cucullanus *Talpæ*. The Mole ; in the fat of the peritonæum.

Cucullanus *ocreatus*. The Mole ; in the intestines ; two inches long.

Cucullanus *Muris*. The Mouse.

Cucullanus *Buteonis*. The Buzzard.

Cucullanus *Ranæ*. The Frog.

Cucullanus *lacustris*. Fresh water fishes.

Cucullanus *ascuroides*. The Silurus Glanis.

Cucullanus *marinus*. The Gadi.

GEN. XI. CARYOPHYLLÆUS. Body cylindrical, fringed at the mouth.

*Caryophyllæus piscium*.

*Inhabits* fresh water fishes ; particularly the Cyprini, Carp Tench, Bream, &c. There is but this species of the genus ; it is about an inch long.

## TÆNIA

10. *Tænia utricularis*, in the cellular substance of the gravid uterus of the Hare.
11. *Tænia ferarum*, in the omentum, peritonæum and liver of Deer.
12. *Tænia caprina*, in the Goat.
13. *Tænia ovilla*, in the peritonæum, liver, and omentum of Sheep.
14. *Tænia cerebrealis*, in the brain of Sheep.
15. *Tænia vervecina*, in the peritonæum of fat weathers.
16. *Tænia granulosa*, in the liver of weathers.
17. *Tænia bovina*, in the liver and thoracic viscera of calves and oxen.
18. *Tænia apri*, in the liver of the wild Boar.
19. *Tænia globosa*, in the abdominal viscera of swine.
20. *Tænia Finna*, in the cellular substance of swine.
21. *Tænia Truttae*, in the liver of the Trout.

b. *Inhabiting the intestines alone.*

22. *Tænia folium*. The Tape-worm. The joints in some degree inclosing one another; the ovarium branched, the branches thick and linear; with transverse compressed fasciculi, the side margin of the articulations narrow and compressed.

*Inhabits* the human intestines, more frequently of women, and in Saxony and Holland is more common than in any other country of Europe, occasioning disease and sometimes death; with much more difficulty expelled than any other worms which infest the human body; they have sometimes been found to the number of 200 in one subject, and are from three to eight feet long, nay it is said, they have sometimes grown to the length of 60 feet. This is the species most common in Britain.

23. *Tænia vulgaris*. The common Tape-worm. Two orifices, one in the back of the ovarium like a dot; the other placed before it, papilliform, that may be pressed out.

*Inhabits* the human intestines, so closely adhering, that it resists the most violent medicines; it is jointed, thin, soft, membranaceous, more adhesive than the *folium*; when alive,  
of

TAENIA.

of a milky colour, and nearly pellucid; from ten to sixteen feet long, and more than four lines and a half broad; the joints sometimes nearly square, sometimes oblong; in the middle finely longitudinally striated; wrinkled transversely on the sides; the ovaria resembling the corolla of a flower. These animals are often discharged from the human body piece meal, or by joints, and there are instances of one person having voided 15,000 joints.

*Taenia cateniformis*. In dogs, foxes, cats, squirrels, bats, rats, and mice; from eighteen to twenty-four inches long.

*Taenia cucurbitina*. In Dogs.

*Taenia ferrata*. In Dogs and Cats.

*Taenia moniliformis*. In Cats.

*Taenia lineata*. In the wild Cat.

*Taenia Mustelae*. In the Otter, Martin, and Fourmart.

*Taenia filamentosa*. In the Mole.

*Taenia Erinacei*. In the Hedgehog.

*Taenia magna*. In the Horse; from 29 to 30 inches long.

*Taenia quadriloba*. In the Horse.

*Taenia caprina*. In the Goat.

*Taenia cornicis*. In the Crow.

*Taenia serpentiformis*. In many birds.

*Taenia crateriformis*. In the Woodpecker.

*Taenia torquata*. In the tame Duck.

*Taenia Scolopacis*. In the Woodcock.

*Taenia Filum*. In the Woodcock.

*Taenia infundibuliformis*. In domestic poultry.

*Taenia Sturni*. In the Starling.

*Taenia Passeris*. In the Sparrow.

*Taenia Hirundinis*. In the Martin and Swallow.

*Taenia nodulosa*. In the Pike, Perch, and other fishes,

\*\* Head not armed.

*Taenia candida*. White, the joints very short, knotted in the middle, with a single aperture.

*Inhabits* the human intestines; frequent in Switzerland and

## TAENIA.

and Russia : from 18 to 120 feet long, more opaque, thicker, and broader than the common Tape worm ; sometimes above half an inch broad ; the joints are finely striated transversely, seldom exceeding a line and a half in length ; the ovaria disposed like the petals of a rose.

47. *Taenia dentata*. The head acuminated and sessile ; the larger articulations transversely striated ; the whole dilated and short ; a raised mouth in the middle of the margin on each side.

*Inhabits* the human intestines ; elongated and narrow ; from 10 to 12 feet long ; broad before ; thicker and more tenacious than the *Solium* ; the ovaria not discernible by the naked eye : the head, on the under side, resembling a heart truncated.

48. *Taenia Phocae*. In the Seal.  
 49. *Taenia bacillaris*. In the Mole.  
 50. *Taenia pectinata*. In the Hare and Rabbit.  
 51. *Taenia ovina*. In the Sheep, especially when giving suck.  
 52. *Taenia equina*. In the Horse.  
 53. *Taenia globifera*. In the Falcon, Buzzard, &c.  
 54. *Taenia Flagellum*. In the Kite.  
 55. *Taenia crenata*. In the Woodpecker.  
 56. *Taenia lanceolata*. In the tame Duck.  
 57. *Taenia setigera*. In the Goose.  
 58. *Taenia Anseris*. In the Goose.  
 59. *Taenia Anatis*. In the Duck.  
 60. *Taenia laevis*. In the golden-eyed Duck and Shoveller.  
 61. *Taenia cuneata*. In the Bustard, Shoveller, and Water Hen.  
 62. *Taenia Alcae*. In the black-billed Awk.  
 63. *Taenia Tordae*. In the black-billed Awk.  
 64. *Taenia Tardae*. In the Bustard.  
 65. *Taenia Linea*. In the Partridge.  
 66. *Taenia maculata*. In the Redwing.  
 67. *Taenia Bufonis*. In the Toad.  
 68. *Taenia Anguilla*. In the Eel.  
 69. *Taenia rugosa*. In the Cod.

**TAENIA.**

- 70. *Taenia Scorpii.* In the Father Lasher.
- 71. *Taenia Percae.* In the Sea Perch.
- 72. *Taenia solida.* In the Banstickle.
- 73. *Taenia Gasterostei.* In the Banstickle.
- 74. *Taenia Siluri.* In the Silurus.
- 75. *Taenia Salmonis.* In the Salmon.
- 76. *Taenia Rectangulum.* In the Barbet.
- 77. *Taenia laticeps.* In the Bream.

**GEN. XV. FURIA.** Body linear, equal, filiform, ciliated on both sides with a single row of reflexed prickles, pressed close to the body.

Of this genus there is but one species.

1. *Furia infernalis.*

*Inhabits* the marshes and vast moorish wastes of Bothnia; the length of a nail, of a carnation colour, often black at the apex; it creeps up the stalks of the carices and shrubs, and being carried off by the wind, enters the skin of such naked parts of men and horses as are not perpendicular, occasioning a sensation at first like that of the prick of a needle, then blackness and a violent itching of the part, soon after acute pain, a red spot and gangrene, at last an inflammatory fever accompanied with swoonings, proving fatal the second, sometimes the first day, and even in a few hours, unless the worm is extracted immediately, which is very difficult, or the part cut out, and the empyreumatic oil of the Birch tree poured into the wound, or coagulated milk or cheese applied.

**GEN. XVI. MYXINE.** Body round, carinated underneath, with an adipose fin; mouth at the extremity surrounded with cirri. Two pinnated maxillæ, and many acute teeth in the fauces. Upper lip solitary and acute.

*Myxine glutinosa.* The Hag. B.

*Inhabits* the European Ocean; entering and devouring fishes, and changing the water into a gluten. It is about eight inches long, but in the warmer latitudes grows to the size of a common Eel. This animal has of late been ar-



## MYXINE.

ranged with the Amphibia Nantes, to which class it most properly belongs ; and is called by the generic name of *Gastrobranchus*.

GEN. XVII. GORDIUS. Body long and round, equal, and smooth.

1. *Gordius aquaticus*. Brown and filiform. B.

*Inhabits* fresh waters, chiefly those with a clay bottom : it swims like a fish through the water, often variously and spirally twisting itself ; its bite occasions inflammation, which may be cured with opium ; it is no otherwise noxious to man, but is said to kill fishes.

2. *Gordius argillaceus*. Wholly yellow. B.

*Inhabits* Clay which it penetrates in every direction. Not sufficiently distinct from the foregoing.

GEN. XVIII. LUMBRICUS. Body round and annulated, often with an elevated band which contains the genitals ; rough with prickles, longitudinally placed, but in general hid ; furnished with a lateral pore.

1. *Lumbricus terrestris*. The Dew-worm or Earth-worm. Red, with eight lines of prickles.

*Inhabits* the vegetable soil and putrid wood. B.

This animal is of great use in the economy of nature, not only furnishing food to half the birds, and to some quadrupeds ; but by promoting vegetation, by boring, perforating, and loosening the soil, and rendering it pervious to rains and the fibres of plants, by drawing straws, and stalks of leaves, and sticks into it ; and most of all by throwing up such numbers of lumps of earth, called worm-casts, which, being its dung, is a fine manure for grain and grass. The band, mentioned in the generic character, does not appear in the young, nor in the old except at pairing time.

2. *Lumbricus marinus*. With two papillæ on the back of each segment, bearing a small bristle in each.

*Inhabits* the bottom of the European Seas. B.

This animal lives under the sand, and is taken by fishermen for bait.

- 3 *Lumbricus*

**LUMBRICUS.**

3. *Lumbricus Thalassema*. Striated, of a dirty red colour and spotted, grey underneath; the mouth funnel-shaped, wrinkled within, and folded at the margin.

*Inhabits* England.

Found on the shores of Cornwall, deep among the chinks of the submarine rocks; smooth and shining, thick at one end, at the other somewhat acuminate; the mouth on the upper side; the funnel purplish.

4. *Lumbricus oxyurus*. Of a whitish livid colour, very acute at the hinder end, obtuse at the anterior, with a round whitish rostrum that can be drawn in or exerted.

*Inhabits* the shores of Suffex.

An inch and a half long, annulated with slender striæ, the rostrum truncated and granular, with a pore conspicuous at the base of the rostrum.

**GEN. XIX. PLANARIA.** Body gelatinous and somewhat flat; with a double ventral pore; the mouth at the extremity.

The insects of this genus are divided into sections, according to the number of their eyes, or the want of them.

\* *Without eyes.*

1. *Planaria viridis*. Oblong, convex above, and green; with white transverse striæ.

*Inhabits* the roots of fuci. B.

\*\* *With two eyes.*

2. *Planaria fusca*. Brown, with black veins, oblong-lanceolated, truncated before, and somewhat hollowed, acute behind.

*Inhabits* stagnant waters. B.

Found upon the leaves of the Menyanthes, Sium aquaticum, and Nymphaea: it is very tender, and creeps like a snail over the surfaces of bodies, but runs nimbly enough in the water; when at rest, or touched, it contracts itself variously.

## PLANARIA.

3. *Planaria lactea*. Depressed, oblong, white, truncated before.

*Inhabits* marshes and stagnant waters ; under the leaves of the Nymphaea.

GEN. XX. SIPUNCULUS. Tube-worm. Body round and long, with a cylindrical mouth attenuated before ; a lateral aperture in the body formed like a wart.

1. *Sipunculus nudus*. The skin close.

*Inhabits* the European Seas. B.

Found under stones.

2. *Sipunculus faccatus*. The skin loose.

*Inhabits* the Indian Ocean, also the British. B.

It is pale brown, reticulated with annular furrows, and longitudinal streaks, and shining with reflections of brassy green ; at each extremity ash-coloured. Tail highly glossy.

GEN. XXI. HIRUDO. Leech. Body oblong, truncated behind and before ; without appendages ; cartilaginous, and moves by dilating the mouth and the tail.

The animals of this genus are androgynous, though it seems requisite that there should be a junction of two individuals. Some species carry their eggs under the belly, others lay them on the leaves of aquatic plants, and others are viviparous. Each egg contains many young. The smaller species have a strong tendency to reproduction, and may be multiplied by cutting.

1. *Hirudo medicinalis*. Common Leech. Elongated and blackish, with lines of different colours on the upper surface, and yellow spots on the under.

*Inhabits* marshes and stagnant waters. B.

The Leech is well known as a phlebotomist ; the teeth are three in number, and of a slightly cartilaginous substance, and, being situated so as to converge when the animal bites, leave a somewhat triangular mark on the skin.

2. *Hirudo sanguifuga*. Horse Leech. Elongated and black ;

**HIRUDO.**

black; beneath of a dull olive colour, with black spots.

*Inhabits* ditches, marshes, and stagnant waters. B.

This species grows to the length of six or seven inches; it is so greedy of blood, that nine of them are said to have sucked a horse to death. It is sometimes killed by the larvae of the *Dytisci*.

3. *Hirudo vulgaris*. Elongated, of a brownish yellow colour; with eight eyes arranged like a crescent.

*Inhabits* aquatic plants. B.

It is about fifteen lines long, and lives on the *Monoculi* and other small water insects; likewise on the inhabitants of the water *Helices*, by which it is reciprocally devoured.

4. *Hirudo bioculata*. Elongated, and of a cinereous colour, with two eyes.

*Inhabits* marshes, and pits in woods. B.

It is nine lines in length, whitish, pellucid, and sprinkled, with ash-coloured spots; often at war with the inhabitant of the *Helix planorbis*.

5. *Hirudo complanata*. Dilated and cinereous, with a double tuberculated line on the back, the margin serrated.

*Inhabits* rivulets. B.

About four lines long; sluggish, attacking the inhabitants of the water *Helices*. It has six eyes.

6. *Hirudo hyalina*. Dilated, pellucid, and yellow; the margin intire.

*Inhabits* the aquatic plants in rivulets. B.

About seven lines long; leads a quiet still life, feeding on the sanies which flows from the animal of the *Helix planorbis*. It has from four to six eyes.

7. *Hirudo piscium*. Elongated and yellowish; with a white pinnated dorsal fin.

*Inhabits* fresh waters. B.

Eight lines long; attenuated before; it infests fishes; it has four eyes. The *H. geometra* of the former edition.

## HIRUDO.

8. *Hirudo Hippoglossi*. Dilated, whitish; in the middle of the body a double white ocellus.

*Inhabits* the skin of the Hollibut.

It adheres firmly to the fish by tubercles, hooks, and points.

9. *Hirudo muricata*. Round and long; the body warty.

*Inhabits* the Atlantic Ocean. B.

## § 275.

## ORDER II. MOLLUSCA.

The animals of this Order have a soft, gelatinous, naked body, of various figure, and most of them have arms or tentacula: these serve either for motion, or for bringing the food to their mouth, and they are probably organs of sensation; for eyes have been discovered in the *Sepia* and *Limax* only, and the head is closely connected with the body. The mouth in some is situated above, in some below, and in others at the extremity. They are either hermaphrodites, or destitute of sex, in which last case they are multiplied by a natural separation of parts. Most of them live in the sea, some in fresh waters, and the *Limax* alone on land.

GEN. XXII. LIMAX. Naked Snail or Slug. Body oblong and creeping; with a fleshy shield above, and a longitudinal flat disc below. A foramen on the right side for the genitals and the excrement. Four linear tentacula above the mouth; eyes in the apex of the greater ones.

Slugs are voracious animals, doing much mischief to gardens, fields, and meadows; they are eaten by crows, ducks, and other birds, and quadrupeds. They are hermaphrodites, and fecundate one another. If the head or the tail be cut off,

**LIMAX.**

off, these parts will grow again ; they are able to sustain a fast of a whole year ; they spin a thread, by which they sometimes suspend themselves, or let themselves down from heights.

1. *Limax ater*. Black Slug. Black and wrinkled.  
*Inhabits* Europe. B.

This animal is well known ; it is exceedingly common in fields and meadows in summer. It feeds on the leaves and roots of vegetables.

2. *Limax succineus*. Red Snail. Somewhat reddish above ; white below.  
*Inhabits* Europe. B.

Found in shady places, at the foot of mountains, about an inch and a half long, without spots.

3. *Limax cinereus*. The great-spotted Slug. Ash-coloured, spotted, and without spots.  
*Inhabits* Europe. B.

Found in woods, gardens, and shady places ; the largest of the genus ; it feeds on the leaves and roots of vegetables ; it is often infested with a small acarus. This, with some others of the genus, has the faculty of suspending itself by a thread from the tail, and thus letting itself down from a height ; in this situation it sometimes copulates. Lister Hist. An. Angl. p. 129.

4. *Limax agrestis*. Small grey Slug. Whitish ; the tentacula black.  
*Inhabits* Europe. B.

Very common in gardens, meadows, fields, and woods, from May to December ; it is from two to nine inches long ; in autumn often destroying the newly sown rye ; in gardens it frequently ascends and eats the leaves of the annual Sunflower ; when touched with the finger it appears as if dead, adhering by its viscosity ; after sun-set, it begins to revive, and wanders about in search of food ; if at this time it is touched with the finger, it draws in its tentacula, but soon puts them out again and proceeds.

5. *Limax flavus*. Amber Slug. Yellow and spotted.  
*Inhabits* Europe. B.

It lurks among the grass ; it is spotted with white.

6. *Limax lanceolaris*. Of a linear lanceolated figure ;  
very

**LIMAX.**

very acute on the sides; the margin furrounded with a membranaceous border; no tentacula.

*Inhabits* England.

Found in the sea at Cornwall. Hardly a Limax.

**GEN. XXIII. APLYSIA.\*** Body creeping; covered with reflected membranes; a membranaceous shield on the back, covering the lungs; a foramen on the right side for the genitals; the anus placed above the extremity of the back; four tentacula situated before.

*Aplysia depilans.* The margin of the tentacula and membranes of the same colour with the disc.

*Inhabits* Europe. B.

Found in the sea about Anglesea; exuding a sanies, which excoriates when it touches the skin: is excessively fetid.

**GEN. XXIV. DORIS.** Body creeping, oblong, flat below; mouth placed forward and below; the anus behind upon the back, surrounded above with cilia. From two to four tentacula above the body on the fore part, and retractile within foramina.

\* *Body acuminated behind; convex and naked above.*

1. *Doris verrucosa* Body tuberculated above.

*Inhabits* the Indian and British Seas. B.

It is semicylindrical, the anterior extremity rounded, with very short tentacula; the margin at the sides deflexed.

2. *Doris electrina.* The front abrupt, bilamellated; amber coloured.

*Inhabits* Anglesea. Pennant Brit. Zool. iv. p. 43.

3. *Doris papillosa.* Covered with papillæ above, with a smooth dorsal line.

*Inhabits* the European Ocean. B.

Taken in the Frith of Forth.

\*\* *Obtus.*

\* Sometimes called Laplysia, which is a typographical error.

## DORIS.

•• *Obtuse at both ends ; flat and covered.*

4. *Doris Argo*. Oval ; body smooth.

*Inhabits* the Mediterranean and British seas.

Of a red colour, at times ; in general, of a lemon yellow the largest of the genus. Thrown ashore when the sea is agitated.

GEN. XXV. APHRODITA. Body creeping, oblong, and covered with scales ; the feet set thick with hair ; mouth terminating and cylindrical ; two setaceous, annulated tentacula ; four eyes.

1. *Aphrodita aculeata*. Oval, rough, and prickly.

*Inhabits* the European Ocean. B.

From three to seven inches long ; it feeds on shell-fish. The body is divided into about 30 segments, on each side of which stand so many short feet or papillæ, each terminated by a fasciculus of black spines or bristles : the sides are furnished with soft and delicate hair, distinguished by a varying gloss of colours, similar to those of a Peacock's tail. It is found sometimes in the stomach of the Cod.

2. *Aphrodita scabra*. Oblong, the back rough with scales.

*Inhabits* the German Ocean. B.

It has twenty feet on each side. Sometimes taken off Brighthelmstone.

3. *Aphrodita squamata*. Oblong, with rough scales, of one colour, with black dots.

*Inhabits* the European Ocean. B.

This species roams freely among the fuci and sertulariæ, creeping at the bottom of the sea ; it is about an inch in length.

4. *Aphrodita lepidota*. Oblong, with a blood-red longitudinal fascia on the back.

*Inhabits* the German Ocean. B.

This species has sixteen feet, with fourteen pair of imbricated scales, finely dotted : the *minuta* of Pennant.

5. *Aphrodita plana*. Oblong, with smooth scales of two colours.

*Inhabits* the Northern Ocean. B.



## APHRODITA.

Taken off Brighthelmstone, if, as it appears to be, the *pedunculata* of Pennant. Brit. Zool. iv. p. 45.

6. *Aphrodita annulata*. Oblong, fusiform, annulated, smooth, excepting a row of minute spines, one on each ring, running along the back; feet small, of a pale yellow colour.

Given from Pennant. Brit. Zool. iv. p. 45.

GEN. XXVI. *SPIO*. Body articulated; extended in a tube, with threads upon the back; the feet rough with bristles, and placed towards the back; two long simple tentacula; two oblong eyes.

*Spio seticornis*. With slender striated tentacula.

*Inhabits* the Ocean.

Found gregarious, chiefly in a clay bottom, about three inches long, forming a tubular dwelling of earthy particles, thin, and three times longer than itself, out of which it extends its capillary tentacula in search of prey.

GEN. XXVII. *AMPHITRITE*. Body annulated and extended in a tube; feet small and warted; tentacula acuminate, close and feathered; no eyes.

*Amphitrite auricoma*. With two cirri on each side, and two rigid gilded flaps on the fore part. (Plate XII. fig. 1.)

*Inhabits* the Northern Ocean. B.

This animal makes its abode in a small, brown, fragile, diaphanous tube. The *Nereis conchilega* of Pennant.

GEN. XXVIII. *TEREBELLA*. Body oblong, creeping, and naked; furnished with branchiæ at the sides, often inclosed in a tube; mouth forward, labiated, and without teeth; with a clavated proboscis; many tentacula about the mouth, which are capillary and ciliated.

*Terebella*

**TÉRÉBÉLLA.**

*Terebella cirrata.* Body round and long, with treble pencils of cirri on the sides.

*Inhabits* the sea at Iceland.

It is red; from three to four inches long, inclosed in a thick brittle tube, of the same length with the inhabitant; when hurt, it pours out a red juice, with which it discolours the water, and renders it opaque; it is found on a sandy bottom.

**GEN. XXIX. NEREIS.** Body creeping and long; feet small, and furnished at the sides with little pencils; tentacula simple, sometimes wanting; eyes four, sometimes two, seldom none.

1. *Nereis noctiluca.* Body so small as to be scarcely perceptible.

*Inhabits* the sea every where. B.

These animals illuminate the sea like glow-worms, but with brighter splendor.

2. *Nereis cærulea.* Smooth and bluish.

*Inhabits* the Ocean. B.

3. *Nereis pelagica.* Convex above, with small feet furnished with warts and cirri.

*Inhabits* the European Ocean. B.

Keeps at the bottom, among the roots of the Ulvæ, under stones, and in empty shells.

**GEN. XXX. NAIS.** Body creeping, long, linear, pellucid and depressed; feet small, with simple setæ; no tentacula: two eyes, or none.

The animals of this genus are multiplied in a wonderful manner, both by natural and artificial division. The alimentary canal runs through the whole body, and on each side are the arteries, in which the circulating fluid is very perceptible, particularly at the posterior articulations; at these articulations the young Naides are generated, and sometimes from three to six of them hang together, and in a short time fall off. Most of them live in fresh waters; whereas, the species of the four preceding genera are all inhabitants of the sea.

## NAIS.

1. *Nais serpentina*. No lateral setæ, three black rings round the neck.

*Inhabits* stagnant waters. B.

Found at the roots of the Lemna, about nine lines long, with a red spiral intestine; there are lateral setæ, but not visible, except with a magnifier.

2. *Nais proboscidea*. With solitary lateral setæ, and a long proboscis.

*Inhabits* marshes, ponds, and rivulets. B.

From two and a half, to four lines long; it is not uncommon in the summer months, and is remarkable for the length of its proboscis, which is naturally exerted, and for the sudden and violent contortions it frequently throws itself into, while its more general motion is smooth and languid; it is the *Nereis lacustris* of the former edition.

3. *Nais digitata*. With solitary lateral setæ; the tail - laciniated.

*Inhabits* the sandy bottom of rivers. B.

In general it hides its head in the sediment; it has no eyes; is about five lines long, with a double row of small ciliated warts; the tail ending in six lacinae.

GEN. XXXI. ASCIDIA. Body fixed, round, forming a sheath; two apertures, one for the most part at the top; the other lower down.

The animals of this genus are only found in the sea; they dilate and contract themselves alternately; and discharge water from their apertures, as if from a siphon; they are more or less of a gelatinous substance, and are fixed to stones, fuci, and shells; muscles sometimes harbour in them; they are all the frequent food of fishes; some of them are eatable, even by man; and others were formerly articles of the *matrimonia medica*.

1. *Ascidia rustica*. Rough, of a ferruginous colour, with red apertures.

*Inhabits* the North and Mediterranean Seas. B.

This species is eatable; it adheres to shell-fish, stones, and fuci; it is somewhat diaphanous, and nearly of the shape of a little barrel, about two inches long; the exterior skin thick and coriaceous, within smooth and whitish; the bag or  
theat.

**ASCIDIA,**

sheath, soft, smooth, and fleshy, of a rose colour ; yellowish below ; the water separated from the exterior skin.

2. *Ascidia Mentula*. Compressed and hairy, the bag red, one of the apertures on the side.

*Inhabits* the Northern Ocean. B.

A rude and shapeless mass ; of a dirty yellow colour, pellucid and gelatinous, about five or six inches long, covered with the fibres of confervæ.

3. *Ascidia conchilega*. Covered with the fragments of shells ; the bag white, passing into blue.

*Inhabits* the Northern ocean. B.

Of a gelatinous substance, somewhat diaphanous, cylindrical, or oval.

4. *Ascidia mammillaris*. Whitish, and somewhat of a parallelepiped shape ; the apertures terminating and of the same colour with the skin.

*Inhabits* the sea at Cornwall.

Firmly adhering in a horizontal position to the submarine rocks ; very irritable ; shapeless, wrinkled and gibbous ; with thin hairs scattered over it ; of a leathery substance and dirty white colour ; the papilla of the apertures hemispherical, of a bright red colour within.

- GEN. XXXII. SALPA.** Body not fixed, gelatinous, open at both apices, empty within ; the intestine oblique.

The animals of this genus are all foreign.

*Salpa maxima*. The body with an appendage at both ends.

*Inhabits* the Mediterranean Sea.

- GEN. XXXIII. DAGYSA.** Body angulated and hollow ; open at both ends.

*Dagysa notata*. Marked at one end with a brown spot.

*Inhabits* the Spanish Seas.

GEN. XXXIV. CLAVA. Body fleshy, clustering and clavated, fixed by a cylindrical stalk; one aperture situated on the top.

1. *Clava parasitica*. The stalk whitish and pellucid; the club red and opaque, set round with pellucid conical and erect points.

*Inhabits* the Baltic.

Found on the *Fucus nodosus*, on shells, pales and beams of wood; with little signs of life, except dilating and contracting its mouth.

GEN. XXXV. ACTINIA. Sea Anemone. Body wrinkled, with eccentric cirri; a single aperture at the extremity; fixed by the base.

The animals of this genus have but a single aperture which serves for receiving their food, and for discharging the indigestible part; they feed on shell-fish, small fish, and other marine animals; they are themselves eatable and some of them well-tasted; they are very remarkable for the power of retracting and exerting their tentacula or cirri. Pieces that are cut off from them they renew; they feel the light in a peculiar manner; most of them are viviparous.

1. *Actinia rufa*. Red, the foramen formed like a rose with pale cirri.

*Inhabits* the Ocean. B.

It adheres to the rocks; it varies little in colour but much in figure, being at times cylindrical, globular, or conical, and sometimes protruding the whole of its interior parts; the cirri are slender, flexible, active, shorter than the body and truncated at the points: one of the most common species; the *equina* of former editions.

2. *Actinia crassicornis*. Reddish, with conical and elongated cirri.

*Inhabits* the Ocean. B.

This is among the largest and likewise one of the most common species, at least on the shores near Edinburgh. The former hangs from rocks or stones in a dangling manner; this is always fixed to some stone in the sand; the body of the one is always pure and clean; that of the present species is generally dirty with sand and pieces of shells, &c. adhering

## ACTINIA.

to it. In their collapsed state the vulgar have given them expressive but obscene names. When expanded they are both objects of great beauty and sometimes brilliancy, resembling a Sun-flower or Anemone. It is the *senilis* of the former edition.

*Actinia plumosa*. With small tentacula, the margin surrounded with pencilled cirri.

*Inhabits* the European Ocean. B.

A very beautiful species, sometimes of a chestnut colour, sometimes of a yellowish brown, a greenish yellow or white; sometimes opaque, sometimes quite pellucid; the laciniae sometimes white, sometimes red or orange coloured.

*Actinia Caryophyllus*. Of a red brown colour, with small pencil-shaped tentacula.

*Inhabits* the British Seas.

Found near Teignmouth.

*Actinia fulcata*. With naked tentacula very numerous, the body longitudinally fulcated.

*Inhabits* the rocks of the Cornish and Anglesea Seas.

*Actinia Dianthus*. With a circular contracted mouth, the disc divided into five lobes.

*Inhabits* the rocks near Hastings.

EN. XXXVI. MAMMARIA. Body smooth, without cirri; a single aperture.

*Mammalia Mammilla*. Conical, ventricose and white.

*Inhabits* the Norwegian Seas.

EN. XXXVII. PEDICELLARIA. Body soft and pedunculated; the peduncle rigid and fixed; a single aperture.

*Pedicellaria globifera*. Head spherical, no neck.

*Inhabits* the Baltic. B.

Among the spines of the *Echinus esculentus*.

EN. XXXVIII. TETHYS. Body not fixed, somewhat oblong, fleshy, without pedunculi. Mouth with a terminating cylindrical proboscis, under an expanded

## TETHYS.

expanded lip. Two foramina at the left side of the neck.

*Tethys leporina*. The lip ciliated.

*Inhabits* the Mediterranean Sea.

GEN. XXXIX. PTEROTRACHEA. Body not fixed, gelatinous; with a gelatinous moveable fin at the abdomen or tail.

*Pterotrachea hyalina*. The head elongated, porrected, and smooth; the tail fin in the centre.

*Inhabits* the Mediterranean Sea.

GEN. XL. HOLOTHURIA. Body not fixed, thick and cylindrical. Mouth on the anterior part among branched tentacula.

1. *Holothuria Physalis*. The Portuguese Man of war. With pendulous unequal filiform cirri.

*Inhabits* the Ocean.

This animal is often observed by sailors swimming in the Atlantic. The body is blown up like a bladder, oval, somewhat triangular and transparent, with a spiral red rostrum.

2. *Holothuria Pentaëta*. With ten tentacula, the body with five rows of papillæ.

*Inhabits* the European seas. B.

About six inches long, running at the bottom of the sea, and swimming far from shore: it is viviparous.

GEN. XLI. LOBARIA. Body convex above, flat below, lobated.

*Lobaria quadriloba*. Tail with lobes like wings.

*Inhabits* the northern seas.

GEN. XLII. TRITON. Body oblong with an involuted spiral proboscis. Twelve divided tentacula, six on each side, the hind ones armed with chelæ.

Triton

## TRITON.

*Triton littoreus*. The shore Triton.*Inhabits* the Italian shores.

Found in cavities of rocks covered by the sea. A similar animal inhabits the shells of the genus *Lepas*.

GEN. XLIII. LERNAEA. Body oblong, somewhat round and naked, fixing itself by two or three cylindrical tentacula like arms. Two ovaries like so many tails.

1. *Lernaea cyprinacea*. Body obclavated, thorax cylindrical and bifurcated, the tentacula lunated at the apex.

*Inhabits* Europe. B.

About half an inch long, and of the thickness of a small straw. It is found adhering to the sides of the Bream, Carp, and Roach, in many of our ponds and rivers.

2. *Lernaea fulmonea*. Body obovate, the thorax obcordated, with two linear close arms.

*Inhabits* Europe. B.

Found in the gills of Salmon, in great numbers, on the first arrival of that fish out of the sea; but after being a little time in fresh water, they drop off and die. The salmon is reckoned in highest season when these animals are found on it.

3. *Lernaea asellina*. Body lunated, the thorax heart-shaped.

*Inhabits* the northern ocean. B.

Found on the pectoral fins of flounders, the haddock, &c.

4. *Lernaea pectoralis*. The head orbiculated and hemispherical, the abdomen obcordated, terminated with a truncated papilla.

*Inhabits* Europe. B.

Found in the gills of the cod, ling, &c.

GEN. XLIV. SCYLLAEA. Body compressed, the back channelled; the mouth a terminal opening without teeth; the tentacula or arms are underneath, and in three pairs.



## SCYLLAEA.

*Scyllæa pelagica*. Fixed ; the extreme tentacula similar ; the middle ones papillary.

*Inhabits* the Ocean.

Found among the *fucus natans*, to which it is fixed by a crenated groove on the back.

GEN. XLV. CLIO. Body in a sheath, swimming, oblong, with two dilated membranaceous arms. Three tentacula besides those at the mouth.

*Clio pyramidata*. The sheath a sort of triangular pyramid ; the mouth obliquely truncated.

*Inhabits* the Ocean.

GEN. XLVI. SEPIA. Cuttle fish. Body fleshy, with a vagina receiving the breast, at the base of which is a tube. Eight arms, set on the inside with warty cirri, besides, in most species, two pedunculated tentacula.

The animals of this genus are remarkable for a black liquor which most of them secrete in a particular receptacle, and which they can discharge when pursued so as to conceal themselves in the obscurity it occasions. The antients used it as ink.

1. *Sepia octopus*. The body without a tail, no pedunculated tentacula.

*Inhabits* Europe and Asia. B.

In hot climates this species grows to an enormous size, and the Indians carry axes in their boats to cut off its arms, with which it sometimes seizes, and would sink them. When boiled for food with nitre it turns red.

2. *Sepia officinalis*. Body without a tail, but marginated, with two tentacula.

This is the species which produces the cuttle-bone of the shops ; it is used by silversmiths, and was formerly valued as an absorbent. It is light, and is sometimes found in immense quantities on the surface of the sea, in some latitudes.

3. *Sepia media*. Body depressed, with a two-edged tail.

*Inhabits* Europe B.

Th:

**SEPIA.**

The body almost transparent and green, but convertible into a dirty brown.

4. *Sepia Loligo*. Sleeve fish. Body somewhat cylindrical and subulated; the tail of a rhombic shape, and two edged.

*Inhabits* Europe, &c. B.

Found frequently in our seas, and being gregarious, they are often driven ashore in multitudes by storms. They are eaten by the common people, and some parts of them, when properly dressed, might be thought a delicacy by the Epicure.

5. *Sepia Sepioides*. Body furnished behind with two round bodies like wings.

*Inhabits* the Mediterranean Sea. B.

Has been taken off Flintshire.

**GEN. XLVII. LUCERNARIA.** Body gelatinous, wrinkled, and branched. Mouth situated below.

- *Lucernaria quadricornis*. Body elongated and twisted, with four dichotomous arms, and tentacula at the apex. (Plate XII. fig. 14.)

*Inhabits* the Norwegian seas.

Found on the *Fucus saccharinus* among rocks.

**GEN. XLVIII. MEDUSA.** Body gelatinous, orbicular and depressed. Mouth in the middle, underneath.

Medusæ are the favourite food of the Cyclopteri, and other larger fishes, of Whales, and of sea birds. They roam about in the night; they have a stinging quality, which has procured them the name of Sea nettles. They soon perish when put into fresh water.

1. *Medusa cruciata*. Marked with a white cross.

*Inhabits* the European Ocean. B.

2. *Medusa aurita*. With four cavities underneath.

*Inhabits* the Ocean. B.

3. *Medusa capillata*. Convex, the margin divided into sixteen segments; hairy.

*Inhabits* the Northern ocean. B.

4. *Medusa*

GEN. II. ECHINUS. Sea Egg or Sea Urchin. Body nearly spherical, covered with a hard crust, often rough, with moveable spines. Mouth placed below, generally with five valves.

Many of the animals of this genus are esculent; and, as well as their crusts, were formerly used medicinally; they inhabit the whole seas, and their crusts are very frequently found fossil; their shells have a fancied resemblance to a garden, with compartments (*area*), and walks, (*ambulacra*), between.

1. *Echinus esculentus*. Hemispherical, with ten ambulacra; the compartments somewhat warty.

*Inhabits the European and Indian oceans.* B.

This species is frequently eaten in the southern parts of Europe, especially when full of eggs. It is often taken in dredging, and lodges in the cavities of rocks, just within low water mark. Besides the spines, it has feet or tentacula, which are the organs of its motion, visible only when in the water, as it draws them in when taken out of it. An *Echinus* that has 2000 spines, may have about 1400 of such feet. The spines are of a white or purple colour.

2. *Echinus lacunofus*. Ovate and gibbous, with five depressed ambulacra.

*Inhabits the Ocean.* B.

3. *Echinus Spatagus*. Ovate and gibbous, with four depressed ambulacra.

*Inhabits the Sea.* B.

When fresh, is of a sulphur colour, which, by degrees, wears off.

These are, perhaps, all the species of this genus which have been discovered recent on the shores of Britain; but a great many species are found fossil, changed into chalk or flint.

## § 276.

### ORDER III. TESTACEA.

The VERMES TESTACEA are animals of a soft gristly substance, covered with a calcareous shell. Most of them are furnished with tentacula, and they do not seem

to be of different sexes. In general they are oviparous; their ova have sometimes a hard shell, sometimes they are soft, and sometimes they form a mass (*flavago, meliceris*). A few of the Testacea are viviparous. The shells of these animals are an essential part of them; they invest the young while yet in the uterus, and grow either by intus-susception, according to some, or by external apposition, according to others. The colours of shells, some of which are very beautiful, are impressed, not on the external coat, but on the shell itself. Some Univalves have, when they are full grown, an elevated margin; others have such a margin from the first, and it forms what is called *Varix*, or *Sutura*. The Cypræas yearly cast their shells, and form new ones to suit their growth.

For the most part, the animal inhabitant of all shells, belongs to one or other of the preceding genera of Mollusca.

These animals are possessed of a considerable reproductive power; and they can even repair their shells when injured.

Many of them serve for food; some produce pearls; the Tyrian purple was obtained by the ancients from a shell fish; the byssus of the Pinnæ and Mytili, furnished them with their most valuable cloth, and it is still used in the Mediterranean for fabricating gloves, stockings, &c. little inferior to some silk.

#### § 277.

The following Books treat particularly of this branch of Natural History.

*Recreatio mentis et oculi in observatione animalium testaceorum.* à Phil. Bonanni. Rom. 1684, 4to.

Mart. Lister, *Synopsis methodica conchyliorum.* Lond. 1685, fol. Oxf. 1770, fol.

Exercitatio de Cochleis terrestribus et Limacibus. Lond. 1694, 4to.

Mart.

- 2<sup>d</sup> edition of the same in 5 vols. 4to. Paris, 1780.
- Nic. Gualtieri, Index Testarum conchyliorum Musæi  
1742. fol.
- F. C. Lesser, Testaceo-theologia. Leip. 1744. et 17  
G. W. Knorr, Vergnügen der augen und des Gemüths  
ung einer Sammlung von Muscheln und andern G  
der See; in 6 vols. Leipz. 1744-1772.
- J. T. Klein, Tentamen methodi Ostacologicæ, sive c  
turalis cochlidum et concharum, in duas classes, gen  
cies. Lugd. Bat. 1753. 4to.
- Adanson, Histoire naturelle du Senegal, 4to. Paris,  
Conte Giuseppe Ginanni, Opere postume, Tomo 2.  
contengono Testacei maritimi paludosi e terrestri del  
e del territorio di Ravenna. Venezia, 1757. folio.
- F. M. Regenfuss, Sammlung von Muscheln, Schnecken  
Schaltiern. Copenh. 1758-78, folio.
- Gicoffroy, Traité sommaire des coquilles tant fluviati  
rellres. Paris, 1767, 12mo.
- Oudaan, Catalogue systématique d'une superbe et nom  
lection de coquillages. Rotterd. 1766, 8vo.
- Arn. Leers, Catalogue systématique d'un magnifique  
coquillages. Amst. 1767, 8vo.
- Martini, Neues systematisches Conchylien Cabinet, ge  
mit Farben erleuchtet. Nurnb. 1767, in 3 vols. 4to.
- The same continued, by J. H. Chemnitz, in 7 vols. mo
- Adolph. Murray Dissertatio, Fundamenta Testaceolog  
1771, 4to. and in Amæn. Acad. vol. 8th.
- E. M. Da Costa, Elements of Conchology. Lond. 1  
——— British Conchology. Lond. 1778, 4to.
- Tho. Pennant, British Zoology, vol. 4th.
- Jonatii a Born. Testacea Musæi Caesarii Vindobonæ

Lightfoot, An account of some minute British shells. Phil.  
zoo. vol. 76.

St Sibbald, An account of several shells observed by him in  
Scotland. Do. vol. 19.

St Petiver, A description of some shells found in the Molucca  
Islands. Do. vol. 22.

St Barbut, The Genera Vermium of Linnæus, Part II. Lond.  
1749.

Linnaeus, The Natural History of British shells. Lond. 1799,  
8vo.

Do. Publishing in Numbers with coloured plates.

Do. Figures of the Birds, Shells, and Plants of Dorsetshire. Writ-  
ten for the new Edition of Hutchins's History of that Coun-  
ty by Dr Richard Pulteney. Published separately for the use of  
Friends. Lond. 1799, folio.

### § 278.

This Order is divided into three sections, viz.

**MULTIVALVIA.** The shell consisting of more pieces than  
two.

**BIVALVIA.** The shell consisting of two pieces, called valves.  
*Conchæ.*

**UNIVALVIA.** Consisting of a single shell. *Cochleæ.*

A. *Cochleæ*, with a regular spire.

B. ———, without any regular spire.

### § 279.

In bivalves (*Conchæ*), the valves (*Valvulae*) are connec-  
ted together at the hinge, (*cardo*), which is considered  
as the bottom, (*basis*), or underside (*latus, margo infe-*  
*rior*) of the shell, by a ligament (*hymen*); this ligament  
occupies the anterior chink, (*rima anterior, vulva*), next  
to which lies the anterior margin (*latus, or margo ante-*  
*rior*). At the hinder margin of the hinge (*latus, or mar-*  
*gosterior*) there is often a depression (*anus*). Oppo-  
site the hinge is the outer or upper margin, (*margo*  
*superior*), which forms the natural opening of the shell.  
Eminences (*umbones, nates*) at the hinge, end in the  
point of the shell (*mucro*). The length of the shell is  
measured from the hinge to the outer margin, and the  
breadth from the anterior to the posterior margin.

PL II,

Y y

If

If we place the shell upon the hinge, so that the anterior side stands forward, the right and left valves are easily known: they are either equally curved on each side of the hinge, (*acquilatæ*), as in the *Ostrea*; or irregularly curved, (*inæquilatæ*), as in the *Veneres*; they are either equally convex, (*æquales*), as in the *Chamæ*; or one valve more convex than the other, (*inæquales*), as in the *Spondylus*. The outline is called *ambitus*, the inner margin *limbus*, and the middle of the outer surface *discus*.

The hinge is either flat, (*depressus*), as in the *Mya Vulsella*; as if a part were cut out, (*excisus*), as in the *Anomia truncata*; longitudinal, as in the *Arca*; bent back, (*reflexus*), as in the *Pholas*; truncated, as in the *Anomia truncata*; situated at the side, (*lateralis*), as in the *Mytilus cygneus*; or at the end, (*terminalis*), as in the *Mya Vulsella*. In general it is furnished with teeth, (*dentatus*), sometimes not, (*edentulus*), as in the *Mytilus* and *Pinna*.

The teeth of the hinge are sometimes compound (*dens complicatus*), as in the *Mastra*; doubled, (*duplicatus*), as in the *Tellina*; recurved, as in the *Spondylus*; longitudinal, as in the *Chama*. In the hinge there are likewise cavities, (*seffula, foræola, sinus, scrobiculus, &c.*)

The posterior depression (*anus*) is for the most part shut, (*clausus*), sometimes open, (*patulus, bians*), as in the *Chama Gigas*; or toothed, as in the *Chama Hippopus*, &c.

On the anterior side, we distinguish the margins round the ligament, (*labia valvæ*), which sometimes lie over one another, as in the *Venus Dysera*; the cartilages (*nymphæ*) to which the ligament is attached, and by which they are covered; these stand sometimes distant from each other, (*biantes*), as in the *Venus meretrix*; or they are sunk down, (*retractæ*), as in the *Venus Dysera*; or truncated, as in the *Tellina Gari*. Round these are sometimes asperities or prickles, (*pubes*), which are sometimes branched, (*ramosa*), as in the *Venus pedicularis*.

The eminences at the bottom of the shell, (*nates, umbones*), are sometimes ear-shaped, (*auriformes*), as in the *Chama*

*Chama gryphoides*; like horns, (*corniformes*), as in the *Chama bicornis*; bent in, (*inflexæ, incurvæ*), as in the *Cardium Cardissa*; or bent back, (*reflexæ*), as in the *Chama Cor.*

With respect to the shell in general, in figure and surface, it is either shallow, (*compressa*), as in the *Cardium Cardissa*; bent down (*inflexa*), as in the *Tellina*; tongue-shaped (*linguæformis*), as in the *Solen Vulsella*; boat-shaped, (*navicularis*), as in the *Arca Noë*; eared, (*aurita*), as in the *Ostreae*; interruptedly striped (*antiquata*), as in the *Cardium edule*; or radiated as in the *Tellina radiata*.

#### § 280.

In the inhabitants of Bivalves there is no distinct head to be observed; a small round elevation above the mouth is generally taken for it; and this is situated in the under part of the body. They likewise want tentacula.

At the mouth they have four membranaceous lips, without maxillæ or teeth. They have what is called a foot, (*pes* or *sustentaculum*), which is sometimes cylindrical, as in the *Solen*; compressed, as in the *Tellina*; or sickle-shaped (*falciforme*), as in the *Cardium*; it serves the animal for progressive motion, and even for springing, as in the *Tellinae*. The *Ostreæ* have no foot. At both sides of the foot, or of the body, are two organs resembling the gills of fishes. They are all oviparous—See Plate XII. Fig. 8.

#### \* *Multivalvia.*

GEN. LI. CHITON. The animal a Doris. Shell with several valves, lying over one another along the back.

The animals of this genus adhere to rocks and stones, and at first view have the appearance of Onisci.

1. *Chiton fascicularis*. With eight valves; the sides of the animal, at the extremity of each valve, set with a pencil of hairs.

*Inhabits* Barbary. &c. B.

Slightly carinated, smooth and cinereous. Found on oyster shells in Dorsetshire. Pulteney.

a. Chiton



## CHITON.

2. *Chiton albus*. With eight smooth valves, carinated; the body white.  
*Inhabits* the northern ocean. B.
3. *Chiton cinereus*. With eight smooth valves, carinated; the body reddish; the margin somewhat ciliated.  
*Inhabits* the Norwegian ocean. B.  
The *larvis* of Pennant. Found near Loch Broom in Scotland.
4. *Chiton crinitus*. With seven valves, thickly set with short hairs.  
*Inhabits* Scotland near Aberdeen.
5. *Chiton marginatus*. With eight valves, smooth; with a serrated reflexed margin.  
*Inhabits* the British seas.

**GEN. LIII. LEPAS.** The animal a Triton. Shell attached by the base; with many valves, which are unequal and erect.

The animals of this genus adhere in clusters to rocks, shells, floating wood, &c. and as they are incapable of changing place, they are supposed to be true hermaphrodites.

1. *Lepas Balanus*. The shell conical and sulcated; the opercula pointed.  
*Inhabits* the European Ocean. B.  
Adheres to rocks, crabs, and other shell fish.
2. *Lepas Balanoides*. Shell conical, truncated, and smooth; the opercula obtuse.  
*Inhabits* the Northern Ocean. B.  
Less than the former species, adhering to crustaceous animals, and often covering large portions of the rocks under high water mark.
3. *Lepas Tintinnabulum*. Shell conical, obtuse, wrinkled, and fixed.  
*Inhabits* the American and Indian Ocean. B.  
Like the *Balanus*, but larger.
4. *Lepas anatifera*. The Barnacle. Shell compressed,  
with

## LEPAS.

with five smooth valves supported on a stalk. (Plate XII. Fig. 3.)

*Inhabits* the sea. B.

Adheres to the bottom of ships; the tentacula, which stick out, have some resemblance to feathers, and our credulous ancestors supposed that the animal of this shell turned to the Bernacle goose.

5. *Lepas cornubiensis*. Like a Limpet, with a dilated bottom, and narrow aperture; the shell fulcated near the lower edges.

*Inhabits* England.

Found on the shores of Cornwall; perhaps but a variety of the *Balanus*.

6. *Lepas striata*. The valves lapping over each other, and obliquely striated.

*Inhabits* England.

Found near Weymouth; also adhering to fuci and sandstone rocks in the Firth of Forth.

7. *Lepas rugosa*. Cylindrical, and nearly as wide at top as at bottom; the upper part often forming a wide tube, and the valves separated from each other at top. Compartments fulcated and transversely wrinkled.

*Inhabits* the British seas.

Frequently more than half an inch high; it adheres to rocks, stones, and shells, particularly the Ostreae. Pulteney.

8. *Lepas elongata*. Cylindrical, white, pellucid, with six valves cleft at top; the operculum obtuse, fulcated and transversely striated.

*Inhabits* Iceland. B.

Sometimes scarcely five lines wide, and yet three inches and more high. Found on the shore at Weymouth, and in the Firth of Forth.

GEN. LIV. PHOLAS. The animal an Alcidia. Shell bivalve and divaricated, with some accessory pieces of a different shape.

I. Pholas

## PHOLAS.

The animals of this genus penetrate the sea rocks, particularly those of a calcareous substance, and lodge in holes which are worn larger by the roughness of their shells, as themselves increase in size. The animal pushes out of its hole, when covered by the sea, in search of food, but on the least alarm instantly withdraws; as it likewise does when the sea retires. They give out a phosphorescent light in the dark.

1. *Pholas Daëtylus*. Shell oblong, reticulated, and striated. (Plate X. Fig. 3.)

*Inhabits* Europe. B.

This species is much admired as food; on some parts of the shores of the Mediterranean, the rocks are broken with large hammers, and the animals taken out.

2. *Pholas striata*. Ovate and multifariously striated.

*Inhabits* Southern Europe and India. B.

A small shell, distinguished immediately by its conoid shape.

3. *Pholas candida*. Shell oblong, and every where rough with decussated striæ.

*Inhabits* Europe. B.

The shell is very thin, silvery, and pretty smooth within, rounded at both ends, with a cleft tooth at the hinge.

4. *Pholas crispata*. Shell oval, more obtuse at one end, waved and striated; the tooth at the hinge curved.

*Inhabits* the Northern ocean. B.

The shell is strong: three inches and a half in breadth, and three quarters in length.

5. *Pholas parva*. With a shell thinner than the former, and the tooth very slender and oblique. Size of a hazel nut.

*Inhabits* England.

Given from Pennant; found in clay rocks on many of our shores; they also penetrate the hulls of ships. This is said by Dr Pulteney, in his account of the shells of Dorsetshire, to be only the young of the preceding species.

\*\* *Bivalvia*.

GEN. LV. MYA. The animal an Ascidia. Shell in general

## MYA.

general gaping at one end. Hinge with a strong thick spreading tooth, not inserted into the opposite valve.

The animals of this genus live under the sand or sleet, and the place where they lie is betrayed by a small hole, out of which they occasionally exert their proboscis. They are caught either to be used as food, or for the pearls which some of them produce.

1. *Mya truncata*. Shell ovate, truncated behind; the tooth of the hinge stretching forwards, and very obtuse.

*Inhabits* the European Ocean. B.

Of a dirty white colour, rough, with irregular transverse striæ or wrinkles; grows sometimes to be two and a half inches long, and two inches broad.

2. *Mya arenaria*. Shell ovate, rounded behind; the tooth of the hinge standing out forwards, rounded, and with a small lateral dent.

*Inhabits* the European ocean. B.

It lurks under the sand, and its place is discovered by two holes; the shell is of a yellowish or dirty white colour; two and a half inches long; the tooth of the hinge longer and more obtuse than that of the *Mya truncata*.

3. *Mya pictorum*. Painter's muscle. Shell oval; the principal tooth of one valve crenulated, longitudinal, and placed at the side; a double tooth in the other valve. (Plate X. fig. 6.)

*Inhabits* Africa, India, and Europe. B.

Found in fresh waters;  $1\frac{1}{2}$  inches long, and  $3\frac{1}{2}$  inches broad; a thin shell, smooth within, and pearly; does not gape.

4. *Mya ovalis*. A thick oval shell, concentrically wrinkled; of an oval green colour, and smooth.

*Inhabits* England.

Given from Pulteney's Dorsetshire. This has likewise been called the Painter's Muscle; it is larger and stronger than the former species, which is but a doubtful native.

5. *Mya pubescens*. Ovate, somewhat pellucid, brittle; somewhat

## MYA.

somewhat truncated before, compressed and flattish; the whole region round the umbo rough and pubescent with a semi-oval tooth in the hinge.

*Inhabits* England.

Given from Pulteney's Dorsetshire. Perfectly white, thin, and brittle; two inches and a half long, three inches and three quarters wide.

6. *Mya margaritifera*. Shell ovate, bending in on the anterior side; the chief tooth of the hinge conical; the apices decorticated.

*Inhabits* the northern hemisphere. B.

A very thick, coarse, opaque shell, producing pearls and mother of pearl; the former generated in the body of the animal, and by perforating the shell artificially produced.

7. *Mya oblonga*. Ovate oblong, with a strong broad tooth in one valve, inserted into a cavity in the other valve; and the least tooth placed between two smaller in the opposite valve.

*Inhabits* England.

Found on the coast of Dorset. Pulteney. About two inches and a half long, and five inches broad.

8. *Mya declivis*. A brittle half transparent shell, with a hinge slightly prominent; less gaping than the *truncata*; near the open end sloping downwards.

*Inhabits* the western Seas. B.

Given from Pennant; it is frequent about the Hebrides; the fish is eaten by the gentry.

9. *Mya dubia*. With the rudiment of a tooth within one shell; and an oval and large hiatus opposite to the hinge; shells brown and brittle.

*Inhabits* England.

Given from Pennant. Found near Weymouth; length of a horse-bean. Made a Pholas by Dr Pulteney.

GEN. LVI. SOLEN. Razor-shell. The animal an *Ascidia*. Shell oblong, gaping at both ends; hinge with a subulated reflexed tooth, often double, not inserted into the opposite valve; the lateral margin somewhat obsolete.

The

## SOLENS.

The animals of this genus reside in the sand; their place is known by a small dimple on the surface: they are dug out to be used as food.

1. *Solen Vagina*. Shell linear and straight; margined at one end; one tooth at the hinge.

*Inhabits* the European and Indian Seas. B.

About five or six inches broad, one inch long; part of an olive colour, striated transversely; the other part chitinous, with arched fasciæ.

2. *Solen Siliqua*. Shell linear and straight; with a double tooth in one valve.

*Inhabits* the European Ocean. B.

The most common species; very like the former.

3. *Solen Ensis*. Shell linear and somewhat curved; two teeth in one of the valves.

*Inhabits* the Mediterranean and British shores.

A good deal less than the two former species.

4. *Solen Legumen*. Shell linear, somewhat oval and straight; the hinge in the middle, with two teeth in one valve, and a bifid tooth in the other.

*Inhabits* the Mediterranean and Atlantic. B.

About two inches and a half broad; one end somewhat broader than the other. Found in Anglesæa.

5. *Solen antiquatus*. Shell oval, oblong, and curved.

*Inhabits* England.

Found near Weymouth. Of a kidney shape; about two inches broad, and one long; brittle, glossy, and whitish. The cultellus of Pennant, not of Linnæus.

6. *Solen pellucidus*. Sub-arcuated and sub-oval; a double tooth in one valve, and a single one in the other, with a process in each shell pointing towards the cartilage of the hinge.

*Inhabits* England.

Given from Pennant. Shell fragile and pellucid; very like the *Legumen*, but less, being only an inch broad. Found on the shore near Edinburgh.

7. *Solen vespertinus*. Oval oblong, with pale red rays; a single tooth of the left valve inserted into a double one of the other valve.

*Inhabits* the Mediterranean Sea. B.

## SOLEN.

Found on the coast of Cornwall and Weymouth. Made a *Tellina* by the late Dr Solander, as it resembles the *Tellina Gari*; but it gapes at each end, and has no flexure to one side.

8. *Solen crispus*. Shell partly smooth, and partly rough, with waved and crisped striæ, and a very long narrow tooth at the hinge.

*Inhabits* England.

Found in the river Tees in Yorkshire; remarkable for the length of its tooth.

9. *Solen fragilis*. Oblong, depressed in the middle, obliquely fasciated.

*Inhabits* England.

Found at Weymouth. White, pellucid, and very thin; half an inch long, and an inch and three quarters wide; a single tooth in one valve, two in the other. Solander.

GEN. LVII. TELLINA. The animal a Tethys. The forefide of the shell sloping down; in general three teeth at the hinge; the side teeth in one of the valves either flat, or wanting.

The *Tellinæ* lie buried in the sleet near the shore, and make two apertures in the sand, by which mark, when the tide recedes, they are easily found; they are eatable, and the favourite Indian food Baccassan is prepared from the *Tellina Gari*.

\* *Ovate and thickish.*

1. *Tellina fragilis*. Ovate, white, and gibbous, with transverse recurved striæ; the umbones yellowish.

*Inhabits* the European Ocean. B.

About an inch broad; a single cleft tooth in one valve, and two teeth in the other.

\*\* *Ovate and compressed.*

2. *Tellina planata*. Ovate, compressed, a little striated transversely, and smooth; the margins acute, with a sort of tomentum on the area about the hinge.

*Inhabits* the European Ocean. B.

About

## TELLINA.

About two thirds of an inch broad, very flat, pellucid, red, and less sloping than the rest of the genus.

3. *Tellina radiata*. Oblong, longitudinally and finely striated and shining, the suture of the depression channelled.

*Inhabits* the European and American ocean. B.

About an inch and a half broad; generally whitish, with red rays.

4. *Tellina inaequalis*. Oblong, one end running out into a beak; one of the valves flat.

*Inhabits* the Mediterranean and Norwegian Seas. B.

Found on the shore of Guernsey.

5. *Tellina trifasciata*. Ovate, somewhat smooth, with three red rays; the area about the hinge rough.

*Inhabits* the European Ocean. B.

6. *Tellina incarnata*. Ovate, the fore-part lengthened out, compressed, and flattish; the umbones somewhat pointed.

*Inhabits* the European Ocean. B.

These two species are sometimes confounded, as they are similar.

7. *Tellina donacina*. Ovate, compressed, and somewhat flat and smooth; very obtuse on the fore-part.

*Inhabits* the Mediterranean. B.

Half an inch long, one inch wide; white or purplish, with red longitudinal rays; the anterior region very obtuse, or truncated like a Donax.

8. *Tellina ferroensis*. Oblong-ovate, compressed, radiated with red and white; very fine transverse striæ; no lateral teeth.

*Inhabits* the Northern Ocean. B.

Found on the shore near Edinburgh.

9. *Tellina rhomboides*. White on the outside, and rough with transverse striæ; bluish within.

*Inhabits* England.

- It seems to be improperly reduced to this genus; about two inches broad, and one inch long; frequent at the mouth of the river Tees, and on the shore near Edinburgh. The *Cuneus reticulatus* of Da Costa: the *Venus rhomboides* of Pennant.



## TELLINA.

10. *Tellina vinacea*. Of a bay colour, with a white ray.

*Inhabits* the shores of Britain and the Baltic.

One inch long, one and a half broad.

11. *Tellina depressa*. Inæquilateral, depressed, with very minute striæ.

*Inhabits* England.

Shell thick and oblong, of a whitish colour.

12. *Tellina rugosa*. With oyal valves, marked with rugged concentric striæ.

*Inhabits* England.

Found at Weymouth; about the size of a filbert. Per-  
nant.

13. *Tellina punicea*. Oval, flat, equilateral, red, and very thickly striated transversely.

*Inhabits* England.

Ovate-oblong, an inch and three quarters long, and an inch and an eighth wide; thin, flat, and strong, with sharp margins. Valves equal and equilateral; strongly marked with the Tellen slope. Pulteney.

\*\*\* *Nearly orbicular.*

14. *Tellina lactea*. Lentiform, gibbous, white, pellucid, and smooth.

*Inhabits* the Mediterranean. B.

A rare shell; seldom an inch in diameter, minutely striated transversely. Great quantities of exotic shells of this species are brought to Europe for shell-work. Found on the coast of Dorsetshire.—Pulteney.

15. *Tellina carnaria*. Smooth, red on both sides, and obliquely striated; the striæ reflexed.

*Inhabits* England.

About an inch broad and long, pretty thick, and reddish on the inside.

16. *Tellina bimaculata*. Somewhat triangular and broad, smooth, and whitish; marked within with two roundish blood-red spots.

*Inhabits* the European and American Seas. B.

A very small species; about the size of a large pea, delicate

## TELLINA.

cate, thin, brittle, and transparent. Found on the shores of Lancashire and Hampshire.

17. *Tellina pisiformis*. Somewhat globular, smooth, red within, and obliquely striated; the striæ on the forepart reflected in an acute angle.

*Inhabits* the European seas. B.

Found at the mouths of rivers; of the size of a pea; white, red at the bottom, the striæ hardly visible with the naked eye.

18. *Tellina cornea*. Globose, smooth, of the colour of horn, with a transverse sulcus.

*Inhabits* the rivers and ditches of Europe. B.

The shell is pellucid and shining, and when viewed with a magnifier, very finely transversely striated; of the size of a pea.

19. *Tellina rivalis*. Obliquely subovate, transversely sulcated, and of an horn colour.

*Inhabits* England.

Found in fresh waters; of the size of a pea; differs from the preceding species in the hinge being more at a side, and not in the middle of the shell. Maton. Lin. Trans. Vol. III.

20. *Tellina cornubiensis*. Small, thick, truncated, with eminent striæ.

*Inhabits* the shores of Cornwall.

Of a somewhat triangular shape, the valves pretty concave, the sides dissimilar; whitish, the beaks of a light purple colour; inside white, smooth, and glossy, the margins delicately notched. Pennant. *Pectunculus truncatus*, Da Costa.

21. *Tellina fausta*. Somewhat compressed, white, with rough transverse striæ.

*Inhabits* England.

Found off Weymouth. One inch and three eighths long, one inch and six eighths broad; one of the primary teeth in each valve bident. Solander.

22. *Tellina proficua*. Nearly lentiform, with transverse, membranaceous, elevated striæ, and very minute longitudinal ones; in the hinge a large linear cavity.

*Inhabits* England.

Found near Weymouth. Pulteney.

## MACTRA.

The shells of this genus are of various figure; they are nearly triangular, inequilateral, smooth, and broader than they are long; they lurk in the sand.

1. *Maetra stultorum*. Somewhat diaphanous; smooth, with indistinct rays; within purplish, the space round the ligament gibbous.

*Inhabits* the Atlantic and American Ocean. B.

Light, brittle, and thin, about one and a half inch long, and nearly the same broad; the valves concave, and the sides nearly equal; of a reddish ash-colour with white rays, or whitish ash-colour with red rays. Found frequent on many of our shores.

2. *Maetra solida*. Opaque, somewhat smooth, and antiquated.

*Inhabits* the European Ocean. B.

A thick, strong, heavy shell, about one inch and a quarter long, and one and three quarters broad; whitish, with several concentric transverse girdles or zones, which are raised or prominent like ribs, especially in old shells.

3. *Maetra lutraria*. Oval, oblong, and smooth; without lateral teeth.

*Inhabits* the European Ocean. B.

Found at the mouths of rivers; the largest of the British species: from four and a half to five inches broad, and about two and a half long; the sides very unequal, sinuous or waved in its contour, and gaping at one end.

4. *Maetra Listeri*. Very tender, roundish, and whitish, with a large triangular pear-shaped cavity at the hinge.

*Inhabits* England.

Found at the mouth of the river Tees; colour whitish, as in all old shells, for this is rarely found recent; a shallow shells; an inch and a half long, two wide.

5. *Maetra subtruncata*. Whitish, and smooth; the sides somewhat truncated.

*Inhabits* England.

Thick, strong, heavy, and opaque; about half the size of the *Solida*. Of a triangular shape: the valves are deep or  
concave

**CARDIUM.**

three-sided ribs; the outermost ciliated with spines.

*Inhabits* the western shores of Africa. B.

Like the two former, but less; about the size of a nutmeg; more brittle, and semi transparent.

*Cardium levigatum*, Obovate; with obsolete longitudinal striae.

*Inhabits* the Atlantic and American Oceans. B.

About two inches long, one and three fourths broad; epidermis thin and blackish, under it the shell sleek, whitish, with a glance of reddish; the striae are very slightly prominent, except towards the outer margin, and several concentric wrinkles run across the shell.

*Cardium edule*, Common Cockle. Antiquated, with twenty-six imbricated fulci, slightly recurved.

*Inhabits* the European Ocean, the Mediterranean, &c. B.

Common on all sandy coasts, lodged a little below the surface; its place marked by a depressed spot. Cockles are taken from Autumn to Spring, and are much esteemed as a wholesome and a palatable food.

*Cardium exiguum*. Somewhat oblong, unequally ribbed, and brownish.

*Inhabits* England.

Found in Kent, and at Falmouth; size of a large currant; of a reddish brown, or sometimes whitish colour. Denovan.

*Cardium fluviatile*. Somewhat flat, thick and white; the ribs flattish.

A large species; found, though rarely, at the mouth of the river Tees, in Yorkshire.

*Cardium amnicum*. Nearly heart-shaped, transversely sulcated, the umbo obtuse.

*Inhabits* England and Denmark.

Found in Ponds, Dorsetshire. Pulteney.

**EN. LIX. MACTRA.** The animal a Tethys. Shell inaequilateral, with equal valves. The middle tooth of the hinge complicated, with a hollow adjoining; the lateral teeth remote and inserted into the opposite valves.

The

## DONAX.

About the size of a hazel nut, thick, strong, and triangular, with very fine longitudinal striae, which, when narrowly examined, appear dotted; often with red longitudinal fasciae. It varies in colour.

3. *Donax Irus*. Oval, and girt with membranaceous, erect, striated wrinkles.

*Inhabits* the Mediterranean Sea. B.

Size of a kidney bean, thin, brittle, and depressed; white, rugged and uneven; found on the coasts of Cornwall, and Dorsetshire. It lodges in holes like a *Pholas*.

4. *Donax p'ebcia*. With large teeth, white, smooth, with two longitudinal fasciae.

*Inhabits* England.

A thick strong shell, not more than half an inch long, and three quarters wide, smooth and glossy.

- GEN. LXI. VENUS. The animal a Tethys. The lips lying over the anterior margin; teeth at the hinge three, close together; the lateral ones diverging from the apex.

The shells of this genus differ in figure; they lurk in the sand. The genus is numerous, but not many are natives of Britain.

\* *With Spines.*

1. *Venus Dione*. Nearly heart-shaped, and transversely sulcated, on the anterior side a double row of spines. Plate X. fig. 16. 17.

*Inhabits* the American Ocean.

A rare and beautiful shell, of a whitish pink colour, with two rows of spines proceeding from the hinge, and growing gradually longer as they recede from it, the space within of a bright carnation colour.

\*\* *Without Spines.*

A. *Somewhat heart-shaped.*

2. *Venus Paphia*. Somewhat heart-shaped, with thickish wrinkles; attenuated wrinkles on the anterior side, the lips complicated.

*Inhabits* the Islands opposite to America. B.

Thick

## VENUS.

Thick and strong, of a roundish shape, and somewhat compressed, white, with small spots, and angled lines of a bay brown colour; on the hinder side a heart-shaped impression.

3. *Venus verrucosa*. With membranaceous striated sulci, warted, especially on the fore side of the shell, the margin crenulated.

*Inhabits* the Mediterranean and British shores.

A thick strong and heavy shell, two inches long, and nearly as much broad; of a dirty whitish colour, with concentric transverse ridges.

4. *Venus cancellata*. With transverse, membranaceous, remote striae; a heart-shaped depression.

*Inhabits* the Indian Ocean.

A thick shell, about an inch and a half long, of a roundish shape, and a little flattened; whitish, with a cast of brown, or pale carnation; the ridges are thin and sharp like plates or blades.

5. *Venus Gallina*. Radiated, with transverse and obtuse striae, the hinder tooth of the hinge the smallest, the margin crenulated.

*Inhabits* the American and European ocean. B.

A pretty little shell; on the hinder side is a strong heart-shaped depression; the *rugosa* of Pennant.

6. *Venus islandica*. Transversely striated, and rugged, gaping at the cartilages, without any depression.

*Inhabits* the Northern ocean. B.

A common shell on some of our shores. In Scotland it is called the Gawky, grows sometimes four inches broad; generally covered with a brown epidermis, under which it appears with fine transverse striae.

7. *Venus Chione*. Smooth, with fine transverse wrinkles, the hinder tooth of the hinge lanceolated.

*Inhabits* the Atlantic, Mediterranean, &c. B.

Thick, strong, and heavy, outside smooth and glossy, with numerous concentric transverse wrinkles, and several faint longitudinal rays.

8. *Venus tigrina*. Lentiform; with crenated and ducated striae, and an oval depression.

*Inhabits* the American and Indian Ocean. B.

Found

## VENUS.

Found at Weymouth ; three quarters of an inch long, and seven eighths broad ; white, with a tinge of purple on the edges. Shells from the West Indies of this species are common in collections ; sometimes three inches wide. Pulteney.

9. *Venus deflorata*. Oval, longitudinally wrinkled, violaceous on the fore-part ; the cartilages black.

*Inhabits* the Atlantic and American Seas. B.

A strong shell, two inches long, three broad ; the wrinkles crossed by small transverse striæ, of a deep violet colour on the fore-part within ; two teeth in one valve, in the other a single one cleft. Found in the Isle of Man.

B. *Of a roundish shape.*

10. *Venus exoleta*. Nearly round, transversely striated, of a pale colour, with faint radii ; a heart-shaped depression.

*Inhabits* the shores of Norway and England. B.

Thick and heavy ; about an inch and a half long, with very numerous concentric transverse striæ.

11. *Venus borealis*. Nearly round, with transverse membranaceous, erect, and very remote striæ.

*Inhabits* the Northern ocean. B.

Thin, transparent, and brittle, depressed or flat ; about one and a half inch long, and near two inches broad, of a pale brown colour, with some blackish streaks.

12. *Venus aurca*. Nearly orbicular, yellow, inæquilateral, with fine and close transverse striæ.

*Inhabits* England.

Rarely an inch in length ; clouded and variegated with zigzag strokes, and lines.

13. *Venus undata*. Thin, convex, and orbiculated, of a white colour tinged with yellow, and marked with thin concentric striæ.

*Inhabits* England.

Given from Pennant. Size of a hazel nut, nearly round, and semitransparent. Common on the shores of Scotland.

C. *Oval, somewhat angular at the cartilages.*

14. *Venus litterata*. Ovate, somewhat angulated before ; with transverse, subundulated striæ.

*Inhabits* India. B.

Thick, and marked transversely with frequent crenulated striæ, sometimes smoother ; of a whitish colour, streaked with

## GENUS.

with lines resembling characters; in British specimens usually faint; in foreign very strong and elegant; an inch and three quarters long, two inches and a half broad. Pennant.

*Venus rotundata*. Ovate, somewhat angulated before; with transverse striæ, the middle tooth bifid.

*Inhabits* the Indian Ocean. B.

Like the last, but less.

*Venus virginea*. Subovate and a little angulated before, with transverse, unequal striæ; the anterior region tumid.

*Inhabits* the Adriatic. B.

An inch and an eighth long, and an inch and five eighths broad; of a pale brown colour, and frequently dotted and variegated with brown spots and streaks. Pulteney.

*Venus sinuosa*. Thin and convex, with a very deep obtuse sinus, or bending on the front.

*Inhabits* England.

Found at Weymouth; figured and described by Pennant.

*Venus ovata*. Ovate, striated elegantly from hinge to margin, and slightly striated transversely.

*Inhabits* England.

Size of a horse-bean. Given from Pennant.

# GEN. LXII. SPONDYLUS. The Thorny Oyster.

The animal a Tethys. Shell with unequal valves, and rigid; two recurved teeth, with a cavity between.

Of this genus there is no British species. They adhere to rocks in deep water, and require force to tear them away; they are harsh and ungrateful as food.

*Spondylus Gæderopus*. Spiny, and somewhat eared.

*Inhabits* the Mediterranean.

This shell is often seen in collections; it varies exceedingly.

# GEN. LXIII. CHAMA. The animal a Tethys. Shell

heavy; hinge with a gibbous dent or callus, obliquely inserted into an oblique cavity. The fore-part shuts close without cartilages.

Of



## CHAMA.

Of this genus there is no recent British species.

**Chama Gigas.** Folded, with arched scales; the depression open.

*Inhabits* the Indian Ocean.

The largest and heaviest of all shells; sometimes weighing 532 pounds, and the animal inhabitant being sufficient to furnish a meal for 120 men.

**GEN. LXIV. ARCA.** The animal a Tethys. The shell with equal valves. Teeth numerous and acute; and inserted into one another.

Some of the animals of this genus adhere by a strong horny foot to rocks under the surface of the sea; others lurk in the sand or mud near the shore.

1. *Arca tortuosa.* of a parallelepiped shape; striated, the valve obliquely carinated.

*Inhabits* the Indian ocean. B.

Said by Pennant to inhabit Cornwall and Weymouth.

2. *Arca Noae.* Oblong, striated, and emarginated at one end; the beaks very remote, the margin open.

*Inhabits* the Mediterranean, Atlantic, &c.

Frequent in collections. Of a brownish colour, clouded, striated, and of a rhomboid figure.

3. *Arca barbatia.* Oblong, and faintly striated.

*Inhabits* the Mediterranean &c. B.

In England of the size of a horse bean; the foreign specimens much larger; overgrown with a byssus, so as to appear bearded. Pennant.

4. *Arca lutea.* Of a somewhat rhomboid shape, marked obscurely with crossing striæ; diaphanous.

*Inhabits* the European Ocean. B.

A small species, about the size of a horse-bean, thick, strong, semipellucid, and milk white; the hinge is set with numerous teeth in a straight line; the sides are dissimilar, one being rounded, the other oblique and flattened.

5. *Arca pisifera.* Nearly orbicular, equilateral, and hairy.

*Inhabits* the Mediterranean, &c. B.

About two inches and a half in diameter, thick, and strong,  
with

**ARCA.**

with many slight concentric wrinkles, and with almost imperceptible longitudinal striæ; of a dull white colour, with chestnut zig-zag lines, and covered with a hairy epidermis. Has been generally supposed to be the *Glycymeris*, but is different. Pulteney.

**GEN. LXV. OSTREA.** Oyster. The animal a Tethys. Valves in most species unequal, and in some degree eared. The hinge has no teeth, but an ovate cavity, and in most species lateral transverse fulci. No depression or space at the ligament.

From the similarity in the structure of the hinge, Linnæus has united the *Ostrea* and *Pecten* of Authors in one genus. Some lurk in the sand; others adhere to rocks, or to the roots of trees on the shore.

\* *Radiated and eared.* Pectines. Scallops.

a. *Equilateral with equal ears.*

1. *Ostrea maxima.* With rounded rays, longitudinally striated.

*Inhabits* the European Seas. B.

With about 14 rays, from three to four inches in length, and somewhat more in breadth. The ears are equal, transversely striated; the rays and interstices transversely, as well as longitudinally striated, and there are also transverse concentric wrinkles, which become stronger towards the margin. These shells were formerly used by Pilgrims as a badge, and were worn in their hat, or on their cloak. In the western islands, the shallow valves were antiently used at feasts for plates, and the hollow ones for drinking cups, to which use these last are still applied.

2. *Ostrea Jacobaea.* With 14 angulated rays; longitudinally striated.

*Inhabits* the Mediterranean. B.

The rays of the shallow valve are rounded, and transversely, not longitudinally striated; the ears are smooth; it is not common.

3. *Ostrea sinuosa.* Ovate; very thickly and finely striated; the inner margin crenated.

*Inhabits* the British sea.

Found

## CHAMA.

Of this genus there is no recent British.

*Chama Gigas*. Folded, with arched s  
from open.

*Inhabits* the Indian Ocean.

The largest and heaviest of all sh  
532 pounds, and the animal inb  
furnish a meal for 120 men.

## GEN. LXIV. ARCA. T

shell with equal valve  
and inserted into or

Some of the animals  
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1. *Arca tortuosa*.

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*Inhabits* th

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2. *Arca Noa*

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the Indian and American oceans. B.  
about an inch and a half lon  
in breadth; very irregular, distorted  
Frequ art by accident. It varies in colour. It  
striate: of Da Costa, but is perhaps the sam

3. *Ar*

above.

With equal valves, and ten  
the inside striæ raised and

the Adriatic. B.

Given from Pennant as the *glabra* Lin. Found i  
This British species is said to have fifteen  
years, and to be a small species; in which circ  
from the *glabra*.

With twenty rays, w  
rounded, and rough, with decussated striæ

the Adriatic and Northern seas. B.

About two inches and a quarter in length, t  
nearly the same. Both valves are in some deg  
but not equally so: one ear is rectangular, the oth  
in the more convex valve, the longitudinal striæ

in the other. In Scotland, where the  
-n, it is called the Clam. It is the

arly equal, thin, one valve  
le line on the top of

and a half long,  
nal, about 20  
linally striat-

, one large stri-

at three quarters of an inch  
ar; the *Pecten parvus* of Da Cor-  
coast of Cornwall.

**\*\* Rude. Ostrea.**

*malleus*. The hammer Oyster. With equal  
ee lobed valves; the lobes transverse.

*Inhabits* the Indian and South Seas.

Frequent in collections of foreign shells; of a black co-  
lour, and in shape resembling a hammer.

12. *Ostrea edulis*. Common Oyster. Semi-orbicular;  
imbricated with waving flakes; one of the valves  
flat and intire.

*Inhabits* the European and Indian Ocean. B.

Well known, and much esteemed as food, and bred in  
such quantities as to make a considerable article of trade.  
The British Oysters were famous even in the time of the  
Romans; and those of Richborough, the antient Rutupi-  
num, were considered as the best. They grow in beds at  
the bottom of the sea, generally in bays, on a substance which  
has the technical name of *cultch*; on this they deposit their  
spawn, and when full grown they are dredged up. They are  
in season, according to the vulgar account, in those months  
which have the letter r in their name; that is from Septem-  
ber to April inclusive. A green colour is artificially given  
to them in some places, but, as this is unnatural and a disease,

## OSTREA.

Found by Lister at Scarborough and the mouth of the Tees; it is also found in the Orkneys. It is of a saffron colour variegated.

b. *With unequal ears; one often ciliated, and spiny within.*

4. *Ostrea obliterata*. Without smooth, with 24 doubled rays.

*Inhabits the Indian Ocean. B.*

About one inch and a half long, of a purplish red colour. Found on the coast of Harwich. Berkenhout.

5. *Ostrea varia*. With equal valves, and thirty rough, compressed, prickly rays; with one ear.

*Inhabits the Mediterranean.*

Thin and semitransparent, of an oval shape, from one and a half to two inches long; with the rudiments of an ear only on one side. Colour varies, generally reddish, sometimes yellow, &c.

6. *Ostrea Pufio*. With equal valves, and 40 filiform rays; with one ear.

*Inhabits the Atlantic and American oceans. B.*

Thick and strong; about an inch and a half long, and somewhat less in breadth; very irregular, distorted, and seemingly hurt by accident. It varies in colour. It is the *Pecten distortus* of Da Costa, but is perhaps the same shell with the *sinuata* above.

7. *Ostrea glabra*. With equal valves, and ten smooth and flattish rays; the inside striæ raised and doubled.

*Inhabits the Adriatic. B.*

Given from Pennant as the *glabra* Lin. Found in Anglesea. This British species is said to have fifteen rays and equal ears, and to be a small species; in which circumstances it differs from the *glabra*.

8. *Ostrea opercularis*. With twenty rays, which are rounded, and rough, with decussated striæ.

*Inhabits the Adriatic and Northern seas. B.*

About two inches and a quarter in length, the breadth nearly the same. Both valves are in some degree convex, but not equally so; one ear is rectangular, the other curved; on the more convex valve, the longitudinal striæ are fewer,  
but

## OSTREA.

but more distinct than in the other. In Scotland, where the animal is frequently eaten, it is called the Clam. It is the *subrufus* of Pennant.

9. *Ostrea lineata*. Valves nearly equal, thin, one valve white, the other with a purple line on the top of each rib.

*Inhabits* England.

Given from Da Costa. About an inch and a half long, and nearly the same broad. Ears nearly equal, about 20 ribs, transversely striated, the interstices longitudinally striated. Found on the coast of Cornwall.

10. *Ostrea obsoleta*. With equal valves; one large striated ear; eight obsolete rays.

*Inhabits* England.

Given from Pennant. About three quarters of an inch long, of a dark purple colour; the Pecten *parvus* of Da Costa. It is found on the coast of Cornwall.

\*\* *Rude*. Ostreae.

11. *Ostrea malleus*. The hammer Oyster. With equal three lobed valves; the lobes transverse.

*Inhabits* the Indian and South Seas.

Frequent in collections of foreign shells; of a black colour, and in shape resembling a hammer.

12. *Ostrea edulis*. Common Oyster. Semi-orbicular; imbricated with waving flakes; one of the valves flat and intire.

*Inhabits* the European and Indian Ocean. B.

Well known, and much esteemed as food, and bred in such quantities as to make a considerable article of trade. The British Oysters were famous even in the time of the Romans; and those of Richborough, the antient Rutupinum, were considered as the best. They grow in beds at the bottom of the sea, generally in bays, on a substance which has the technical name of *cultch*; on this they deposit their spawn, and when full grown they are dredged up. They are in season, according to the vulgar account, in those months which have the letter r in their name; that is from September to April inclusive. A green colour is artificially given to them in some places, but, as this is unnatural and a disease,

## MYTILUS.

oil are the remedies. In warm climates it grows to a large size.

4. *Mytilus incurvatus*. Very crooked on the side, near the end; then greatly dilated, and covered with a thick, rough epidermis.

*Inhabits* England.

Found in Anglesea. Pennant.

5. *Mytilus pellucidus*. Thin, transparent, with purple and blue longitudinal fasciæ.

*Inhabits* England.

Found in Anglesea, sometimes in oyster beds, sometimes in trowling over stutchy bottoms. Pennant.

6. *Mytilus Modiolus*. Smooth, the anterior margin, carinated, the beaks gibbous, the hinge somewhat lateral.

*Inhabits* the Mediterranean and Northern oceans. B.

A large, thick, and heavy shell, six inches long, three broad; the largest of the British muscles. On the outside blackish, within sometimes very finely coloured. It inhabits deep water, fixes on the fishermens bait, and is drawn up with the lines, but is seldom thrown on shore.

7. *Mytilus umbilicatus*. Oval, the space opposite to the hinge deeply indented or umbilicated.

*Inhabits* England.

A strong shell, like the *Modiolus*; but the space opposite to the hinge is depressed and bent inwards so as to form a deep hollow or umbilicus. Found in Anglesea. About 3 inches long. Pennant.

8. *Mytilus cygneus*. Ovate; somewhat compressed on the anterior part; very brittle; the hinge lateral.

*Inhabits* Europe. B.

Found in lakes, and at the mouths of rivers; a large and broad species, from five to six inches broad, and near three inches long; with numerous concentric striæ and wrinkles; of a dull greenish colour, pretty convex, the umbones decorticated.

9. *Mytilus anatinus*. Oval, somewhat compressed, and very brittle, with a membranaceous margin; the umbones decorticated.

*Inhabits* Europe. B.

Found

## MYTILUS.

Found in fresh, particularly stagnant waters. Like the *Mya pictorum*, but distinguished by its brittleness and hinge. It likewise very much resembles the former species, but is not so convex, of a clearer green colour, and only half the size.

10. *Mytilus discors*. Oval, horny, subdiaphanous; on the anterior side longitudinally, and on the posterior transversely striated.

*Inhabits* the Northern and Southern ocean. B.

Of the size of a kidney bean, thin, and brittle, of a light greenish colour, with a faint tint of brown, or rosy; the valves very concave, longitudinally divided into three areas or compartments.

GEN. LXVIII. PINNA. The animal a Limax. Sub-bivalve, brittle, erect and gaping, with a silky beard. Hinge without teeth, the valves adhering on the one side.

The Pinnæ sometimes grow to a large size, and stand erect in the sand or mud in deep water; they likewise fix themselves to the rocks by their byssus, and thus are not affected by the agitation of the waves.

1. *Pinna pectinata*. One half longitudinally striated, the other side transversely wrinkled.

*Inhabits* the Indian Ocean. B.

Six inches long by three wide, very thin and fragile, of an horn colour, but at the base varying and slightly coloured. Ten or eleven ribs run diverging from the apex, for two thirds of its width from the hinge side; each rib set with concave prickles, the remaining part destitute of ribs, but wrinkled in a direction obliquely transverse with respect to the ribs. Found at Weymouth. Pulteney.

2. *Pinna muricata*. Striated, with concave, ovate, acute scales.

*Inhabits* the Indian Ocean. B.

About five or six inches long, and two or three wide; of an horn colour, tinged with a faint flesh-coloured hue, 10 or 12 irregular longitudinal ribs, with concave prickles.

Besides these two, a very large species was found by Dr. Walker off the island of Barra in 1764, called by him the *Pinna borealis*.



## §. 288.

The Cochleae or Univalve shells, except perhaps the Paper Nautilus, (*Argonauta*), grow with their shell; accordingly the structure of the shell depends on the form of the animal, and the various surfaces of shells on the situation of the pores in its skin.

The shells of Univalves are sometimes without any spire, as in the Patella; or the wreaths (*anfractus*), are irregular, as in the Serpula, but in general they are regular. These are so turned that when the extremity of the spire or apex is made to point downwards, the wreaths revolve according to the motion of the sun (*anfractus secundi*); or if the Cochlea is laid on the opening or mouth towards the observer, the wreaths rise from the left to the right hand, and the shells are then called *Cochleæ dextræ*; but in some instances, the wreaths proceed in a contrary direction, and the shells are then called *Cochleæ sinistæ*, and the wreaths *anfractus contrarii*.

The Columella, about which the wreaths revolve, proceeds through the middle of the shell. The beginning of the Columella and of the spire make the apex or *muco*; and the end (*basis*), is at the mouth or opening (*apertura*); this is sometimes continued out into a sort of process called *cauda*, which in general is channelled or furnished with a gutter (*canalis*). The end of the wreaths is called the outer lip (*labium dextrum, exterius, or labrum*); and the inner lip (*labium interius, sinistrum*), covers the columella. Near this is often placed a perforation called (*umbilicus*). The wreaths are connected together by sutures (*futuræ*). The uppermost wreaths taken together are called the spire (*spira*). The last, and generally the largest wreath, is called the body or belly of the shell (*corpus, venter*), and the upper side of it the back (*dorsum*). The inner cavity of the shell is filled with the animal, and in all the univalves is simple. But in the genus Nautilus there are many chambers lying behind one another (*testa polythalamia*), in which the animal lives. These chambers are penetrated by a cylindrical

lyndrical opening (*sipho*), sometimes in the middle, sometimes at one side, and, externally the shell often appears articulated at the partitions.

The fore part of the shell (*testa antica*), according to Linnæus, is that part which lies next the wreaths, and that in the neighbourhood of the mouth or opening he calls the hind part or base (*postica, basis*).

#### § 282.

Upon the head of the animal inhabitant there are either two or four feelers, or tentacula. Those that have four are land animals. All water Cochleæ have but two tentacula. Many of the land species can live a long time in water; but the aquatic species die in a short time on dry land.

The land Cochleæ draw in their tentacula very readily; those of the water do not; but they can stretch them out, bend them at the points, incline them downwards, or lay them close upon the body. They are certainly organs of a sense unknown to us. The situation of the eyes is various.

At the mouth they have sometimes maxillæ; sometimes, particularly the sea Cochleæ, a proboscis. Their food consists of plants and of water which is filled with the infusory animalcula. They can endure hunger for a long time.

On the body is to be seen what is called the foot; on which the animal, with a particular undulatory motion, creeps and swims. At this place is likewise formed the operculum, by which the animal shuts itself up in the shell, and which in some, as in the Trochi, is horny or cartilaginous, and in others, as the Turbines, testaceous. The land Snails close their shells in winter with an operculum formed of their indurated slime. (Plate XII. fig. 6).

\* *Univalvia*.

A. *With a regular spire.* Cochleæ.

GEN. LXIX. ARGONAUTA. The animal a Sepia  
or

## ARGONAUTA

or a Clio. Shell spiral, involute, membranaceous, with one cavity.

Of this genus there is no British species.

**Argonauta Argo.** The paper Nautilus. The carina of the shell subdentated on both sides.

*Inhabits* the Indian and Mediterranean Seas.

This elegant shell is inhabited by an animal resembling the *Sepia octopodia*. In calm weather it rises to the surface, and spreads out its arms over the shell, which serves it for oars, and raising and expanding a double membrane of wonderful tenuity, as a sail, it glides along with the breeze. When danger threatens it suddenly withdraws into the shell, and sinks to the bottom. Some maintain that the animal is not attached to the shell, but can quit it when there is no other mode of escape. It is often taken by fishermen among *Sepia*, near the rocks on the shore, and sometimes it enters their nets.

## GEN. LXX. NAUTILUS. The animal a

Shell divided into compartments by perforated partitions.

Of this genus there is no British species.

1. *Nautilus Pompilius*. With a heart-shaped aperture, the wreaths obtuse and smooth.

*Inhabits* the Indian and African oceans.

This species is frequent in collections; it is large and solid, covered with a white crust, under which it is beautifully marked with brown spots, and waving striae; it is therefore often decorticated, and used for drinking cups in the East.

A specimen of the *Nautilus spirula* was given to the Editor, as found in Aberlady Bay, about twelve miles east of Edinburgh. This however was most probably accidental.

**GEN. LXXI. CONUS.** The animal a Limax. Shell convoluted and turbinated. The aperture open at the ends, longitudinal, linear, without teeth, and entire at the base; the columella smooth.

This genus comprehends about 70 species, but they are wholly

## ONUS.

wholly foreign ; many of them are much esteemed, and form one of the principal articles in cabinets. In general they are found on rocky shores.

*Conus marmoreus.* Conical, and brown, with ovate white spots ; the wreaths of the spire channelled.

*Inhabits* Asia.

A beautiful species, of which there are several varieties, not uncommon in collections ; the spots are large and distinct.

*Conus Ammiralis.* The Admiral. Rough at the base, with dots.

*Inhabits* the shores of South America.

This is one of those shells for which collectors give a great price. One hundred Guineas have been offered for that variety of it known by the name of *Cedo nulli*. Very few perfect specimens are known, and these are only in the first-rate cabinets.

## N. LXXII. CYPRAEA. The animal a Limax.

Shell involuted, sub-ovate, obtuse and smooth. Aperture open at both ends, linear, dentated on both sides, and extending the whole length of the shell.

This is likewise a very numerous genus, consisting of beautiful, polished and coloured shells, of which only one is a native of Britain. They live in the sand at the bottom of the sea, and are provided with a membrane which they can throw over their shells, and thus preserve them always pure and polished. They annually leave their shells to form a new and larger one.

*Cypraea Tigris.* Ovate, obtuse behind, rounded before, with a testaceous longitudinal line.

*Inhabits* the Indian and Adriatic seas.

One of the most common of the genus in collections, and one of the prettiest. It is of a ferruginous, yellowish, or bluish colour, with numerous spots, frequently running into one another ; whitish at the sides and underneath, with an oblique line along the back.

*Cypraea Moneta.* The Cowry. Margined with knobs, and whitish.

*Inhabits* the Atlantic and Indian Ocean.

## CYPRAEA.

This shell in Africa and the East Indies passes for money, about 2000 of them being equal in value to a Rupee. About 30 or 40 vessels are annually laden with these shells in the Maklivia Islands, and exported to Africa, Bengal, Siam, &c. for the purposes of commerce.

3. *Cypraea Pediculus*. The small Cowry. Transversely fulcated.

*Inhabits* the sea every where. B.

These shells are among the jewels and trinkets of the inhabitants of the South Sea Islands, as well as of other parts of the world. It is thick and strong, of the size of a horse-bean, and frequent on all the shores of Great Britain.

- GEN. LXXIII. BULLA. Dipper. The animal a Limax. Shell convoluted, and without spines. Aperture nearly close at the ends, oblong, the length of the shell, entire at the base. The columella oblique and smooth.

The species of this genus are all of a swollen bubblelike appearance, whence the name. The animal is too large for the shell, and cannot contract itself so as to retire wholly within it. Some inhabit the sea, and are immersed in the sand, an inch or two deep; others are found in fresh running or stagnant waters.

1. *Bulla aperta*. Roundish, pellucid, transversely striated, quite open.

*Inhabits* the Cape of Good Hope. B.

Size of a filberd, white, with transverse concentric striae, or wrinkles, glossy within, extremely thin, light, and brittle, and so pellucid that print may easily be read through it. Fished up at Weymouth, and not unfrequently found at Caroline Park, west of Leith.

2. *Bulla patula*. With one end much produced, and fusiform.

*Inhabits* England.

Found at Weymouth. Pennant. Though this is quoted by Gmelin and by Da Costa as the *Bulla aperta*, the description and figure in Pennant shew it to be a very different shell from the above.

3. *Bulla*

ILLA.

*Bulla Hydatia.* Rounded, pellucid, somewhat longitudinally striated; the vertex umbilicated.

*Inhabits* the Mediterranean. B.

Size of a hazel nut; thin, pellucid, and brittle; of a dirty yellowish hue, owing to a thin epidermis, under which the shell is of a dirty white. Found at Weymouth.

*Bulla lignaria.* Obovate, and somewhat oblong; transversely striated; the vertex subumbilicated.

*Inhabits* the Mediterranean and Adriatic Sea. B.

Two inches long, one and a quarter broad. A strong shell, of a wood-brown colour. Found in several places both in England and Scotland.

*Bulla fontinalis.* Ovate, pellucid; aperture ovate-oblong, and turned the contrary way; the spire obsolete.

*Inhabits* Europe. B.

Three eighths of an inch long; the lowest wreath inflated, and constituting almost the whole of the shell. Common in rivers, ponds, and on aquatic plants.

*Bulla cylindrica.* Cylindrical, smooth, white, and very thin.

*Inhabits* England.

About twice the size of a grain of wheat; a little umbilicated at the end. Found at Weymouth.

EN. LXXIV. VOLUTA. The animal a Limax. Shell unilocular and spiral. The aperture without a cauda, and somewhat open at the ends. The columella plicated; in general without an interior lip or umbilicus.

This genus comprehends some of the most beautiful shells of the inter-tropical climates; the English shores afford only two or three species; the essential character is the plicated Columella.

*Voluta tornatilis.* Closed at the ends, ovate, and sub-striated; the spire elevated, and somewhat acute; the columella with a single plait.

*Inhabits* England.

Size

## VOLUTA.

Size of a small olive, of a pale red colour, with two white fasciae. Found at Anglesea.

2. *Voluta pallida*. Intire and oblong-ovate; the spire elevated, the columella with four plaits.

*Inhabits* the African ocean. B.

Size of a grain of wheat, sometimes larger; thin, of a milk-white colour, and polished. Found on the western coasts of England.

3. *Voluta Jonenfis*. A very thin brittle shell, with two small wreaths.

*Inhabits* the Isle of Jona, one of the Hebrides.

4. *Voluta papalis*. Emarginated, and transversely striated; the margin of the wreaths and the lip denticulated; the columella with four plaits.

*Inhabits* the Indian Ocean.

This is one of those shells called mitres, which are much valued by collectors. It is whitish, with numerous spots of a deep or brownish red colour, and, when recent, covered with a thin epidermis. The animal is said to be of a poisonous nature, and to wound those who touch it with a kind of pointed trunk.

## GEN. LXXV. BUCCINUM. The animal a Limax.

Shell spiral, and gibbous; the aperture oval, ending in a channel or gutter, which runs out towards the right; the cauda notched; the interior lip dilated.

The Buccina are in general strong and hollow; the larger kinds were the first trumpets, by the sound of which the soldier was antiently summoned to arms. They adhere to rocks and stones, and deposit their ova in deep water. This genus is very numerous, as are also those of the two following, the Strombus and Murex, which, however, from their general resemblance, have been all comprehended in one by Muller, under the name of Tritonium.

3. *Buccinum Perdix*. Ovate, inflated, somewhat sulcated, and waved with white; the aperture without teeth.

*Inhabits* the Indian and American Oceans. B.

This shell has been dredged up at Weymouth, and thrown

## BUCCINUM.

- on shore after storms ; the size of a hazel nut ; the exotic shells are as large as a hen's egg. Pulteney. The only British species of the section of Ampullacea.
- 2. *Buccinum porcatum*. Ventricose, ribbed, and brown ; the first wreath almost covering the one above it.  
*Inhabits* England.  
Size of a large hazel nut, smooth, whitish, and the upper part set round with two series of tubercles. Found at Weymouth.
- 3. *Buccinum Lapillus*. Ovate, acute, striated and not muricated ; the columella somewhat flattened.  
*Inhabits* the European Ocean. B.  
A most common shell on all our shores ; subject to great variety ; of a whitish colour, sometimes with yellow or chestnut fasciae. The animal is one of those which yield a beautiful colour, similar to the Tyrian purple of the ancients ; it resides in a transverse gland, lying near the head, the juice of which, when put on linen and laid in the sun, changes from colour to colour, till at last it settles in a bright indestructible crimson.
- 4. *Buccinum undatum*. Oblong, coarse, and transversely striated ; the wreaths waved and angulated.  
*Inhabits* the European Ocean. B.  
A common shell, residing in deep water ; from  $3\frac{1}{2}$  to 4 inches long, by  $2\frac{1}{2}$  wide. White, underneath a thin brown epidermis ; with waving longitudinal ribs. It varies without the longitudinal ribs ; the *striatum* of Pennant.
- 5. *Buccinum reticulatum*. Ovate, oblong, transversely striated, longitudinally wrinkled ; the aperture dentated.  
*Inhabits* the Mediterranean, &c. B.  
Of the size of a hazel nut ; varying much in colour ; common on the rocky parts of the coast.
- 6. *Buccinum vulgatum*. Ventricose, and oblong ; with longitudinal plicated striae, crossing transverse ones, that are finer and undulated.  
*Inhabits* the Mediterranean &c. B.  
Of middle size, varying in colour ; the *Pullus* of Pennant.
- 7. *Buccinum*



## BUCCINUM.

7. *Buccinum anglicum*. Oblong, with transverse elevated striae, and six brown wreaths.

*Inhabits* England.

8. *Buccinum minutum*. With five wreaths, striated transversely, ribbed longitudinally.

*Inhabits* England.

Found at Weymouth, and several other places; about half an inch long; the *ambiguum* of Pulteney.

9. *Buccinum hepaticum*. Ribbed, longitudinally waved, and ending upwards in knobs; spire sharp and prominent, with five or six wreaths.

*Inhabits* England.

Dredged up at Weymouth; an inch long, five eighths of an inch wide; of a dull brownish colour. Outer lip striated within, inner lip with one fold or tooth in the upper part. Pulteney.

10. *Buccinum lineatum*. Small, pyramidal, or sharp-pointed. Dark brown, lineated spirally with white.

*Inhabits* England.

About a quarter of an inch long, and half as much wide; the outer lip much expanded. Common on the coast of Cornwall and Dorset, sometimes adhering to fuci.

GEN. LXXVI. STROMBUS. The animal a *Limax*.

Shell spiral, with one side large; the aperture with a dilated outer lip ending in a gutter, which turns towards the left.

The shells of this genus are found on rocky shores; many of them are thick, strong, and heavy; the young shells want one of the essential characters, the dilated lip, and are thus sometimes confounded with the *Buccina* or *Murices*.

1. *Strombus Pes Pellicani*. The lip palmated with four angulated digiti; smooth within.

*Inhabits* the European and American oceans. B.

With ten wreaths, tuberculated along their ridges, the spire ending in a fine point; about two inches long; a pretty common shell on some coasts.

2. *Strombus*

**STROMBUS.**

2. *Strombus costatus*. Brown, the wreaths marked with elevated longitudinal ribs.

*Inhabits* England.

Found on the sands of Cornwall and Dorset. Scarcely half an inch long, and turbinated with ten wreaths, and in most a marginal elevated line in the future. Has the appearance of a Turbo; but the outer lip is expanded, and it has a tendency to a canal at the bottom. Da Costa. Pulteney.

3. *Strombus Scorpius*. Lip divided with seven digits, which are knobbed; the hindermost the longest.

*Inhabits* the Indian ocean.

A rare shell; the faux red and striated, with white teeth on each lip.

**GEN. LXXVII. MUREX.** The animal a Limax.

Shell spiral, and rough with membranaceous sutures. The aperture ends in an entire, straight, or somewhat ascending gutter.

The shells of this genus, from the ruggedness of many of them, have got the English name of Rocks. They inhabit rocky shores, and some of them lurk in the sand, where, with their hard proboscis, they were antiently supposed to make those round holes we often find in shells, in order to feed on the animal within.

1. *Murex Erinaceus*. With manifold spinous ridges; the wreaths knobbed; the tail abbreviated.

*Inhabits* the Mediterranean. B.

A thick, strong, and heavy shell, about two inches long, and near an inch wide. Body formed of six strong longitudinal ridges, which give it an angular figure; spire nearly as long as the body; the whole shell transversely ribbed, the ribs alternately large and small, and appear to be formed of imbricated arched scales.

2. *Murex antiquus*. Oblong, the cauda open; eight round wreaths.

*Inhabits* the Northern ocean. B.

This is probably nothing but a variety of the *Buccinum undatum*.

3. *Murex despectus*. Oblong, with a short open cauda; eight wreaths with two elevated lines.

*Inhabits* the Northern ocean. B.

Thick,

## MUREX.

Thick, strong, and heavy ; white without, and commonly smooth, but finely striated in the transverse direction ; three inches long, sometimes four or five ; the largest of the British univalves.

4. *Murex Tritonis*. Ventricose, oblong, and smooth ; with rounded wreaths, the aperture dentated ; the cauda short.

*Inhabits* the Indian and Southern oceans.

This shell is frequent in collections ; it is used at this day in Africa and the East as a trumpet. It grows sometimes to be sixteen inches long ; it is of a brown colour, with black and yellow spots of the shape of scales.

5. *Murex clathratus*. Oblong, with a cauda ; fulcated, with sub-membranaceous longitudinal plicæ.

*Inhabits* the sea at Iceland. B.

A shell answering to this description, is not unfrequently found near Edinburgh, adhering to the roots of large fuci that have been thrown ashore after a high wind. It is about half an inch long, with six wreaths, deeply fulcated longitudinally, and thick set with numerous, thin, sharp-edged plates or ridges ; differing considerably from the following.

6. *Murex costatus*. Channelled, the wreaths with distinct longitudinal ribs.

*Inhabits* England.

About half an inch in length, smooth, and very glossy ; neatly ribbed, with about eight equi-distant white ribs, broad, thick, and not close set. Found in Cornwall and Dorset. Da Costa. Pulteney.

7. *Murex corneus*. Oblong and coarse ; the margins of the wreaths plane, tuberculated at the apex, the aperture without teeth ; the cauda ascending.

*Inhabits* the Northern ocean. B.

Three inches long, and an inch and a half wide ; generally covered with a brown epidermis, but underneath white ; the apex distinguished by a smooth, round papilla or knob.

8. *Murex fuscatus*. The wreaths crenulated ; the upper stria denticulated.

*Inhabits* the Mediterranean. B.

Turrit with 12 wreaths ; an inch and a half long ; there are four crenulated striæ, and a fifth in all the lower wreaths,  
with

**MUREX.**

with strong conic spines or teeth. Found at Weymouth.  
Pulteney.

9. *Murex reticulatus*. Turrated, subulate, smooth: the wreaths flat and reticulated.

*Inhabits* England.

About half an inch long, with eight or nine wreaths, each with four strong spiral lines, intersected by longitudinal stræ.

Da Costa.

10. *Murex carinatus*. Ventricose, the wreaths rising into angulated ridges. The aperture semicircular.

*Inhabits* England.

Near four inches long, with five or six wreaths.

**GEN. LXXVIII. TROCHUS.** The animal a Limax. Shell spiral, and nearly conical. The aperture almost tetragonal or rounded; above transversely contracted; the columella oblique.

This genus is divided into three sections; those species which are umbilicated, and those which are not: and those which are turrated.

\* *Umbilicated, erect, the columella perforated.*

1. *Trochus Magus*. Obliquely umbilicated and convex; the wreaths obtusely knobbed.

*Inhabits* the Mediterranean. B.

Three quarters of an inch high, by an inch wide; deeply and widely umbilicated; moderately strong and thick, and somewhat depressed; colour various.

2. *Trochus cinerarius*. Obliquely umbilicated and ovate; the wreaths rounded.

*Inhabits* the Mediterranean, &c. B.

Strong, thick, and much flattened, with oblique purple streaks on an ashen ground; wreaths but little elevated, and sometimes scarcely distinct; umbilicus, in some, scarcely distinguishable. The *umbilicaris* of Pennant.

\*\* *Imperforated, erect, the umbilicus shut.*

3. *Trochus striatus*. Conical, the lowest wreath subangulated; the aperture obovate.

*Inhabits* the Mediterranean. B.

## TROCHUS.

A small species : grey, with five longitudinal black lines, alternately interrupted at the base of the wreaths.

4. *Trochus Conulus*. Shell conical and smooth; the wreaths distinguished by an elevated line.

*Inhabits* the Mediterranean and European seas. B.

Thick, strong, and conical; seldom more than three eighths of an inch high. The tip almost always crimson.

5. *Trochus Zizyphinus*. Conical, livid, and smooth; the wreaths margined.

*Inhabits* the European ocean. B.

About an inch high and wide; strong and thick; livid, but variegated longitudinally, with reddish purple waved stripes.

6. *Trochus crassus*. Cinereous, marked with black lines or spots; the columella somewhat dentated.

*Inhabits* England.

Thick and strong; found on several parts of the coast of these kingdoms. Pulteney. The *Turbo lineatus* of Da Costa.

7. *Trochus fragilis*. The wreaths rounded, formed of granulated ridges, alternately larger and smaller.

*Inhabits* England.

An inch and a quarter long, and an inch and an eighth wide; thin, fragile, and conical; brown, with broad longitudinal deeper-coloured stripes. Found at Weymouth. Pulteney.

8. *Trochus terrestris*. Minute, conic, livid.

*Inhabits* England.

Found in Cumberland by Mr Hudson. Pennant.

9. *Trochus Mortoni*. Small, with four wreaths elegantly striated.

*Inhabits* England.

Found in Northamptonshire by Mr Morton.

10. *Trochus Listeri*. Small, with six or seven wreaths.

*Inhabits* England.

Found in Lincolnshire by Dr Lister. Half the size of a pepper-corn; pellucid and yellowish.

GEN.

**GEN. LXXIX. TURBO.** The animal a *Limax*.  
Shell spiral and solid. Aperture contracted, orbicular and intire.

The Turbines adhere to rocks near the shore. Some of them are turrated, that is, taper with a regular spire.

\* *Neritoidei* ; the margin of the aperture columnar, flat, and imperforated.

1. *Turbo obtusatus*. Roundish, smooth, ventricose above, and very obtuse.

*Inhabits* the Northern Ocean. B.

Sulcated with six, seven, or eight furrows; sometimes only lined; of a brownish yellow colour.

2. *Turbo neritoides*. Ovate, smooth, and somewhat obtuse.

*Inhabits* the European ocean. B.

Thick and strong, almost globose, smooth, and of the size of a hazel nut; varies in colour; a very common shell on the rocks near the shore.

3. *Turbo littoreus*. The Periwinkle. Subovate, acute, and striated.

*Inhabits* the European ocean. B.

A common shell, frequently sold for the sake of the animal, which, though nearly allied to the snail, is generally eaten.

4. *Turbo rudis*. Subovate; wreaths swollen, lip thick and glossy within.

*Inhabits* England.

Like the preceding species, but the spire more depressed, and it wants striae either transverse or longitudinal; the colour greenish. Found in Devonshire by Dr Maton. Donovan.

\*\* *Solid and imperforated.*

5. *Turbo Cimex*. Oblong-ovate, with decussated striae and raised dots.

*Inhabits* the Mediterranean. B.

A minute species; thick, without glots. Found on the coasts of Cornwall and Guernsey.

6. *Turbo Pullus*. Ovate and smooth, the aperture lengthened out on the fore part.

*Inhabits* the Mediterranean. B.

## TURBO.

A minute species; delicate, transparent, smooth and glossy; rose colour, varied with purple or crimson zones, streaks, &c.

\*\*\* *Cancellated.*

7. *Turbo Clathrus*. Turrated, and not umbilicated; the wreaths contiguous and smooth.

*Inhabits* the Mediterranean, Atlantic, and Indian Oceans. B.

This shell is easily known by its raised, arched, longitudinal ribs. It is allied to the *Turbo scalaris*, the famous Wende trap, so highly valued by collectors.

8. *Turbo laeticus*. Turrated, with longitudinal, elevated, close striæ.

*Inhabits* the Mediterranean. B.

A very small shell, with five wreaths, varying in colour.

9. *Turbo striatulus*. Somewhat cancellated and turrated; the wreaths contiguous, with varicose interrupted ridges.

*Inhabits* the Mediterranean. B.

Size of a hemp-seed; white, with four wreaths. The *carinatus* of Da Costa.

10. *Turbo elegans*. Ovate, cinereous, spirally, and convexly striated, the aperture as if added.

*Inhabits* England, France, and Italy.

Thin, transparent, brownish, or mottled; wreaths closely striated, and decussated with scarcely perceptible longitudinal striæ. Found in woods, and on downs. The *tumidus* of Pennant; the *striatus* of Da Costa.

11. *Turbo fontinalis*. Umbilicated, conical, with rounded smooth wreaths.

*Inhabits* England.

About a quarter of an inch high, with five prominent wreaths. Found on water plants in Dorsetshire. Pulteney.

\*\*\*\* *Taper shells, properly called Turriti.*

12. *Turbo duplicatus*. The wreaths marked with two acute carinæ.

*Inhabits* the Coromandel coast. B.

A strong shell, with about 12 wreaths; found by Dr Lister at Scarborough; five inches long.

13. *Turbo*

## TURBO.

13. *Turbo exoletus*. The wreaths with two obtuse distant carinæ.

*Inhabits* the coast of Guinea. B.

The *cinctus* of Da Costa. Found on the coasts of Lincolnshire and Lancashire. About two inches long; white, mottled with chestnut, and sometimes brown.

14. *Turbo Terebra*. The wreaths with six acute carinæ.

*Inhabits* China, Africa, and England.

With three large spiral ridges, and three lesser ones on each wreath; from 12 to 16 wreaths; a common shell on many parts of the coast.

15. *Turbo unguinus*. The wreaths with ten obsolete striæ.

*Inhabits* the European and Mediterranean seas. B.

With sometimes 24 wreaths, and about two inches long, of a pale colour; sometimes mottled with brown; or perhaps a variety of the *duplicatus*.

16. *Turbo bidens*. Pellucid; the wreaths contrary, the suture somewhat crenated; the aperture bidentated behind.

*Inhabits* Europe. B.

Brown, very fragile, thin, and cylindrical, about three quarters of an inch long, with ten or eleven wreaths; found in woods, upon trees, and among moss.

17. *Turbo perversus*. Pellucid; wreaths contrary, not crenated, the aperture with three dents.

*Inhabits* Europe. B.

Found in the same places as the foregoing.

18. *Turbo tridens*. Whitish; the aperture with three dents.

*Inhabits* Italy. B.

Scarcely two lines long. Found on water plants.

19. *Turbo muscorum*. Ovate, obtuse, pellucid, with six wreaths of equal size; the aperture without dents.

*Inhabits* Europe. B.

About a line long; found among mosses.

20. *Turbo Ulvæ*. With four wreaths, the first ventricose; the aperture oval.

*Inhabits* England.

Found



## TURBO.

Found on the *Uva Lactuca* on the shores of Flintshire. Size of a grain of wheat ; of a deep brown colour. Pennant.

21. *Turbo fasciatus*. With six wreaths, white, marbled or fasciated with black.

*Inhabits* England.

Length half an inch. Frequent in Anglesea, in sandy soils near the coasts. Pennant.

GEN. LXXX. HELIX. The animal a *Limax*. Shell spiral, sub-diaphanous, and fragile. The aperture closed at the ends, lunated within, or circular, but a segment of the circle as it were cut off.

The animals of this genus are all either inhabitants of the land or of fresh waters ; they feed on vegetables, but can sustain a fast altogether incredible ; some, it is said, having revived after being 14 or 15 years in a state of torpidity. They are possessed of a very considerable degree of reproductive power, and are capable of regenerating even the head. Their amours are conducted in a very extraordinary manner: in the breeding season they are provided with a number of sharp, horny, and delicately formed spicula, lodged in a cavity of the neck, and which opens externally on the right side. Upon the approach of two snails about the end of May or beginning of June, a singular combat, perhaps by way of preliminary dalliance, takes place, and for some time they discharge these spicula against each other. By degrees they advance, their ammunition being expended, they terminate their amorous quarrel, and an union succeeds. They deposit their eggs under some clod, or in some small sheltered cavity, where the young are hatched completely formed.

\* *Carinated, the margin of the wreaths acute.*

1. *Helix Lapidica*. Umbilicated, and convex on both sides ; the aperture transverse, margined, and ovate.

*Inhabits* Europe. B.

Three quarters of an inch wide, one quarter deep ; thin, and semipellucid, nearly equally convex above and below ; wreaths five, the exterior one with a sharp edge, striated transversely, and on a nice inspection elegantly chagrined ; not common.

2. *Helix*

## HELIX.

2. *Helix striatula*. Somewhat carinated, umbilicated, convex, striated, and gibbous underneath; the aperture somewhat round, but lunated.

*Inhabits* Europe. B.

One fourth of an inch wide, radiated transversely, with white and brown. Found in the bark of old trees.

3. *Helix Planorbis*. Somewhat carinated, umbilicated, flat, concave above; the aperture obliquely ovate, and acute on both sides.

*Inhabits* Europe. B.

Found in stagnant waters and rivers; half an inch wide, quite flat on the lower side, and of a horn colour.

4. *Helix complanata*. Carinated downwards, umbilicated, convex, flat below; the aperture semicordated.

*Inhabits* Europe. B.

Like the foregoing, but thicker and stronger in proportion; not more than two or three lines in breadth; the animal black. Found in stagnant waters.

5. *Helix Vortex*. Concave above, the aperture oval and flat.

*Inhabits* Europe. B.

Found in stagnant waters and rivers, closely adhering to aquatic plants; one third of an inch wide; the animal red, with white tentacula; very tenacious of life.

**\*\* Rounded and umbilicated.**

6. *Helix cornea*. Umbilicated above, flat, and blackish, with four round wreaths.

*Inhabits* Europe. B.

An inch wide, one quarter in depth, of a horny colour, wreaths a little wrinkled, coiled up within the outermost; the animal black, and very timid; found in fresh waters.

7. *Helix hispida*. Umbilicated, convex, rough with hairs, and transparent; with five wreaths; the aperture roundish, but lunated.

*Inhabits* Europe. B.

Found in fields and gardens; three eighths of an inch wide; the hairs fall off soon after the animal is dead.

8. *Helix*

## HELIX.

8. *Helix Pomatia*. Sub-umbilicated, sub-ovate, obtuse, pale coloured; the aperture roundish, but lunated.

*Inhabits* Europe. B.

The esculent snail; the largest of the British species, being an inch and three quarters long; colour pale brown, or whitish, with three bands of a deeper colour; in winter it shuts itself up in the shell with a calcareous operculum.

9. *Helix arbustorum*. Umbilicated, convex, and acuminate; the aperture nearly circular, bimargined; elongated before.

*Inhabits* Europe. B.

Found among hedges and shrubs; brown, with yellowish lines, and a single band running along the middle of the wreaths; about three quarters of an inch long.

10. *Helix aspersa*. Sub-imperforated, nearly globose, and yellow; with four red fasciae, interrupted with whitish spots; the lip white.

*Inhabits* Europe. B.

The *hortensis* of Pennant, the *vulgaris* of Da Costa. Our most common Snail. It should not perhaps stand in this section, because it is not umbilicated; but Muller says, that before its lip is fully formed it is perforated, and that it closes the hole by adding the lip.

11. *Helix cricetorum*. Umbilicated, depressed, and yellowish, with one or more brown fasciae.

*Inhabits* Europe. B.

Common on heaths and dry grounds; three fourths of an inch broad; horn coloured when young, then whitish.

12. *Helix turturum*. Umbilicated, rounded, and thin; the aperture semi-lunar.

*Inhabits* Europe. B.

Found in woods; the favourite food of the wood pigeon. Allied to the *memoralis*, but the macro of the shell is more obtuse.

13. *Helix lucida*. Pellucid, umbilicated, depressed, and very smooth.

*Inhabits* England.

About three eighths of an inch long, exactly resembling the

## HELIX.

the *ericetorum* in figure, but smooth and glossy, and wholly without striae, marks or bands. Pulteney.

14. *Helix virgata*. White, umbilicated, with two or three brown bands.

*Inhabits* England.

Found on dry banks ; half an inch wide ; like the *ericetorum*, but smaller, the umbilicus deep, but not wide at the top, as in that shell. Da Costa. Pulteney.

15. *Helix rufescens*. Umbilicated, and striated ; of a pale red colour.

*Inhabits* England.

Common in moist and marshy places ; half an inch wide ; distinguished from the *virgata* and *ericetorum* by a slight carina, or edge, on the outside of the lower wreath. Pennant.

\*\*\* *Rounded, and not umbilicated.*

16. *Helix vivipara*. Imperforated, subovate, obtuse, and horny ; with brownish bands ; the aperture nearly orbicular.

*Inhabits* Europe. B.

Found in fresh, particularly stagnant waters ; of a horny appearance, of a dark olive-green colour, with three darker bands on the body wreath. Nearly as large as the common snail. The animal has a large head, and its young are hatched within the shell.

17. *Helix nemoralis*. Imperforated, roundish, smooth, transparent, and fasciated ; the aperture roundish, but lunated.

*Inhabits* Europe. B.

Very common in hedges and fields ; varying exceedingly in its colours and fasciae, but always smooth and polished ; the most beautiful of our land shells.

18. *Helix compactilis*. Rounded, somewhat pellucid, of a brown colour, with three deeper coloured bands on the body, one of which is continued on the other wreaths.

*Inhabits* England.

The spire higher than in the *arbastorum* or *nemoralis* ; the upper part of the body sometimes slightly carinated. In woods, but not frequent. Pulteney.

## HELIX.

\*\*\*\* *Turrited.*

19. *Helix subcylindrica*. Imperforated, sub-cylindrical, obtuse ; with four wreaths, the aperture oval.

*Inhabits* Europe. B.

Found in fresh waters ; a quarter of an inch long ; of a brown or chestnut colour ; wreaths striated, or finely plicated, the whole length of the shell ; sometimes the sutures have a coronated appearance. Extremity ending suddenly in a small smooth button-like whirl.

20. *Helix stagnorum*. Sub-perforated, and sub-turrited, with fine wreaths ; the aperture ovate.

*Inhabits* Europe. B.

Found in fresh waters ; whitish, sometimes brown ; about three lines long ; wreaths wrinkled obliquely, in the transverse direction.

21. *Helix octona*. Sub-perforated ; with eight wreaths, the aperture nearly round.

*Inhabits* Europe. B.

Found in bogs and marshy places ; half an inch long ; thin, pellucid, and smooth.

22. *Helix polita*. Imperforated, with ten flat smooth wreaths ; the aperture oblong-oval.

*Inhabits* England.

Thick, solid, and smooth, as if polished ; white, wreaths so flat as to be scarcely distinguishable, except by a separating line. On the Dorset coast, but not common. Pulteney.

\*\*\*\*\* *Ovate, imperforated.*

23. *Helix stagnalis*. Of a subululated sub-angulated shape ; the aperture ovate.

*Inhabits* Europe. B.

Found in standing waters ; the largest of the British fresh-water univalves : generally about an inch long, but in other countries grows to two inches and a half ; thin, brittle, whitish or yellowish, with six wreaths ; the first turgid, and as large as all the rest.

24. *Helix fragilis*. Subululated, round, and pellucid ; the aperture ovate-oblong.

*Inhabits* Europe. B.

Found in stagnant waters ; like the former, but only half the

**HELIX.**

the size. Distinguished by the wreaths being more rounded and the apex much shorter.

25. *Helix palustris*. Oblong, acuminate, and brown; the aperture ovate.

*Inhabits* Europe. B.

Found in marshes; brown, glossy, and smooth; finely striated longitudinally; semi-pellucid, and stronger in its texture than the *stagnalis*; more slender also in proportion to its bulk; three quarters of an inch long.

26. *Helix putris*. Obtuse, and yellow; the aperture ovate.

*Inhabits* Europe. B.

Found on water plants; extremely thin, with three wreaths; seems to be the same shell with the *limosa*.

27. *Helix detrita*. Conical, and white; with red transverse lines; the aperture ovate.

*Inhabits* Europe. B.

One inch long, near half an inch wide, with six wreaths; the inner lip reflexed, and forming by its fold a small umbilicus. Found in fresh waters, near Weymouth. Pulteney.

28. *Helix obscura*. Conical, and brown; the aperture without teeth; the lips white.

*Inhabits* Europe. B.

Found on the trunk of the beech; the animal white, the eyes alone black; shell small and acuminate; when viewed with a glass finely striated; six wreaths.

29. *Helix lubrica*. Conical, tawny, shining, pellucid, and acute; the aperture without teeth; the lips reddish.

*Inhabits* Europe. B.

Found among mosses, and on moist putrid wood; the animal black, white below, and can live in water; the shell is very smooth and shining; about two lines and a half long, with five or six wreaths.

30. *Helix limosa*. Somewhat oblong, pellucid, and acute; the aperture ovate.

*Inhabits* Europe. B.

Found in marshes; scarcely half an inch long, thin, almost membranaceous, pellucid, and horn-coloured; seems to differ little from the *putris*.

## HELIX.

31. *Helix tentaculata*. Ovate, obtuse, covered with slime; the aperture sub-ovate.

*Inhabits* Europe. B.

Of a brown colour, three fifths of an inch in length, with five wreaths; mouth usually closed with its operculum. Found in stagnant waters.

32. *Helix Auricularia*. Ovate, and obtuse; the spire acute, very short; the aperture greatly expanded.

*Inhabits* Europe. B.

Common in rivers, ponds, and ditches. Thin, brittle, and pellucid; of a horn colour, with four wreaths; the body forming almost the whole of the shell.

33. *Helix lacvigata*. Obovate, very obtuse, pellucid and quite smooth.

*Inhabits* England.

Thin, fragile, of a pale but dull flesh-coloured hue; five eighths of an inch long; striated longitudinally; body large, ending in a small but well defined spire; in its recent state covered with a thin epidermis. Found on the beach in Dorsetshire.

GEN. LXXXI. NERITA. The animal a Limax. Shell spiral, gibbous, and flattish below. The aperture semi orbicular, or semi-lunar; the lip of the columella transverse, truncated, and flattish.

This genus consists of a number of very beautiful new shells, but they are mostly foreign.

1. *Nerita glauca*. Smooth, with a somewhat obtuse spire, the umbilicus half shut up by a gibbous lip, which is of two colours.

*Inhabits* the shores of Tranquebar. B.

The British specimens of this shell are not so beautiful as the foreign, nor so large. With us they are from the size of a hazel nut to that of a walnut, and sometimes prettily enough girdled.

2. *Nerita fluviatilis*. Wrinkled, and without teeth, with white spots.

*Inhabits* Europe. B.

Shell strong; size of a cherry-stone; black or greenish.

**NERITA.**

with small whitish oblong spots, and two wreaths, the larger forming almost the whole shell. No umbilicus. The aperture lunated and without teeth. Found in rivers.

The *Nerita littoralis*, is the shell already described as the *Turbo neritoides*.

**3. *Nerita pallidulus*.** Of a horn-colour, the spire a little exerted.

*Inhabits* England.

Given from Da Costa, p. 51. Tab. IV. fig. 4. 5. Shell thin and brittle, semitransparent; from the size of a cherry-kernel to double that bigness; quite smooth, except a few longitudinal wrinkles; very convex, yet the turban is somewhat produced; umbilicated. Said to be found on the coasts of Kent and Dorset; but not mentioned by Dr Pulteney.

**GEN. LXXXII. HALIOTIS.** The animal a *Limax*.

Shell ear-shaped; the mouth spread open; the spire lateral and flattened; the disc perforated with a longitudinal row of holes.

The animals of this genus adhere closely to the sea rocks and when they are forcibly torn off, which is done with difficulty, they die. They themselves, however, can dissolve the gluten by which they adhere, and thus are capable of voluntary motion. They are all esculent. A few of the shells want the row of holes.

***Haliotis tuberculata*.** Ear-shell. Sub-ovate, the back transversely wrinkled and tuberculated.

*Inhabits* the European and Indian oceans. B.

Thick and strong, and varies much in size; the outside commonly covered with filth, and serpulæ, lepades, and other shells; the foramina run from the spire near the edge, the whole length of the shell; they are numerous, and increase in size as they proceed, the last seven or eight being pervious; the inside is pearly, and of great splendour. Thrown up on several of our shores; very common in Guernsey.

**GEN. LXXXIII. PATELLA.** Limpet. The animal a *Limax*. Shell nearly conical and without any spire.

The



## PATELLA.

The species of this genus adhere to the sea rocks near the shore, and are not without difficulty detached, except they are taken by surprise. They are all eatable. A few are inhabitants of fresh water.

\* Labiated; i. e. *furnished with an internal lip; the shell intire.*

Of this section there is no British species.

\*\* Dentated, *at the base, i. e. with an angulated margin.*

1. *Patella vulgata*. Sub-angular; the angles fourteen, obsolete; the margin dilated and acute.

*Inhabits the European and Indian oceans. B.*

A very common shell on all our shores, varying exceedingly in colour; when young, flattish, ridged, and the margins deeply crenated; when old more conical, the colours less brilliant, and the ridges almost obliterated. The animal is frequently eaten by the poor, and used by the fishermen as bait.

2. *Patella Mitrula*. Solid, sub-conical, transversely plicated; the margin scolloped.

*Inhabits the island of Barbadoes. B.*

Small, thick, and solid; white; and strongly imbricated. Found near Weymouth. Pulteney.

\*\*\* Mucronated; *the vertex acuminate and recurved.*

3. *Patella ungarica*. Intire, conically acuminate and striated; the vertex forming a revolute hooked beak.

*Inhabits the Mediterranean, American, &c. Seas. B.*

An elevated shell, round at the base, with an uneven margin. Under the epidermis of a whitish colour, commonly with a carnation hue; the top turning down like a phrygian bonnet.

4. *Patella militaris*. Striated longitudinally and transversely, narrowing gradually, and ending in an hooked beak.

*Inhabits England.*

Found at Weymouth. White, semi-pellucid, and conic; aperture quite round and even; the beak recurved and descending almost to the edge of the shell. Pulteney.

5. *Patella*

## PATELLA.

5. *Patella lacustris*. Quite intire, oval, and membranaceous ; the vertex ending in a reflexed point.

*Inhabits* Europe. B.

Found in rivers and lakes, adhering to aquatic plants ; of a horn colour ; the vertex pointed and a little recurved ; about two inches long, and one broad.

6. *Patella fluviatilis*. Intire, oval, and somewhat horny ; the point of the vertex towards the margin ; the aperture oval.

*Inhabits* Europe. B.

Thin, fragile, and minute ; two lines and a half long ; smooth, except for a few concentric striæ ; like the preceding species, but the point more obtuse and oblique.

*Intire, without a pointed vertex.*

7. *Patella pellucida*. Obovate, gibbous, and pellucid ; with four blue rays.

*Inhabits* the Mediterranean and Northern oceans. B.

Smooth and horny ; about three quarters of an inch long, and five eighths wide ; in young shells the vertex is very near the interior margin ; in the older much farther removed.

8. *Patella parva*. Intire, small, somewhat smooth ; whitish, with red rays.

*Inhabits* England.

Given from Da Costa, p. 7. Tab. VIII. fig. 11. Size of a pea ; thin, semi-transparent, not glossy, the vertex placed much on one side, and blunt ; with a few prominent, longitudinal streaks, coloured with broad intermediate rays, and circular bands of a dull red. Said to be found in Dorsetshire, but not mentioned by Pulteney.

*With a perforated vertex.*

9. *Patella Fissura*. Oval, with reticulated striæ ; the vertex recurved, and slit open on the fore part.

*Inhabits* England, Norway, &c.

Small, strong, white, elegantly cancellated, and very conic, being as high as it is long.

10. *Patella graca*. Ovate and convex ; the margin crenulated in the middle.

*Inhabits* the Mediterranean and Atlantic. B.

Strong

**PATELLA.**

Strong and thick; deeply and closely reticulated, the longitudinal striae the strongest; the vertex is perforated by an oblong hole.

**GEN. LXXXIV. DENTALIUM.** The animal a Terebella. Shell tubular, straight, with one apartment; - open at both extremities.

The Dentalia live a solitary life, perpendicularly or obliquely immersed in the mud on those shores that are least exposed to tempests.

**Dentalium Entalis.** Tooth-shell. Round, somewhat curved, continuous and smooth.

*Inhabits* the shores of India and Europe. B.

About an inch and a half long, white, taper, strong, and smooth, resembling the canine teeth of some animals.

**GEN. LXXXV. SERPULA.** The animal a Terebella. Shell tubular, adhering to other bodies; often interrupted with partitions.

The animals of this genus are frequently found in clusters, and even various species on the same stone, rock, or shell.

1. *Serpula Spirillum.* Regularly spiral, orbicular, and pellucid, the wreaths round, and gradually lessening.

*Inhabits* the Ocean. B.

A minute shell, so as hardly to be visible with the naked eye. Adheres to Sertulariae and Zoophytes; it has four or five wreaths, rounded and striated longitudinally.

2. *Serpula Spirochis.* Regularly spiral and orbicular; the wreaths above, somewhat channelled inward, and gradually lessening.

*Inhabits* the Northern ocean. B.

About a line in diameter, round, white, smooth, and pale; convex above, flat below; adhering generally to the leaves of the *Fucus serratus*, and other fuci, shells, &c.

3. *Serpula trigonata.* Creeping, waved, and three sided.

*Inhabits* the Ocean. B.

Adheres to shells, fuci, stones, &c.; white, strong, and tough, generally tapering from the mouth to the extremity.

GEN. LXXXVII. SABELLA. The animal a Nereis, with a ringent mouth, and two thick tentacula behind the head. Shell tubular, composed of grains of sand, aggregated upon a membranous vagina.

1. *Sabella alveolata*. Composed of numerous tubes communicating by a hole.

*Inhabits* the British Ocean.

A mass of grains of sand, and finely comminuted shells, forming tubes, with an animal in each. All the tubes end in orifices on the surface, so as to give the mass a honey-comb appearance. Common.

2. *Sabella granulata*. A single curved tube, made of grains of sand, of a brown colour.

*Inhabits* the Northern ocean. B.

The *Sabella tubiformis* of Pennant. The animal is the *Amphitrite auricoma*: about three or four inches long, round and tapering, of the size of a goose-quill.

3. *Sabella lumbricalis*. Coarse, creeping, fragile, open at both ends; the mouth of the animal without tentacula; its body aculeated and articulated.

Adheres to stones, often in a writhed and serpentine manner; formed of sand, closely agglutinated.

4. *Sabella conchilega*. A tube formed of the mucus of the animal, enveloped by large fragments of broken shells.

*Inhabits* England.

The *Sabella radis* of Pennant. About an inch or two long; found generally in the inside of old and dead bivalves.

### § 283.

## ORDER IV. ZOOPHYTA.

THE animals of this Order are called animal plants (*Zoophyta*), because, though they resemble plants in their external structure, they are true animals, as they possess sensation and voluntary motion, and take their food.

food by means of external members. They include all those bodies called Corals and Corallines, Polypi, &c. They are all inhabitants of the sea; and their soft cartilaginous parts, which are the organs of their senses and motions, dry in a short time after they are taken out of their proper element, so that in Cabinets we can only preserve their hard parts. These firm parts are in general external, and form certain hollows or cells. In some, as the *Isis*, *Gorgonia*, &c. the hard parts are internal, and we can separate the cortical part from the woody substance. These firm parts are either calcareous, or horny (*keratophyta*), or fungous. No particular intestines or organs of generation can be observed in the Zoophyta, but they increase either by ova which they generate on particular places of them, as in the *Sertulariæ*; or the young spring out of their substance, as in the *Hydræ*.

The resemblance of these Plant-animals to vegetables consists in this, that from the egg is formed a bulb, which shoots up into a stem, and sends off branches: there is also a root, which however is merely the organ of attachment, affording no nourishment to the animals, which are furnished with arms as so many mouths, or rather limbs, to convey the food to the mouth: these members only are capable of voluntary motion, for the entire body is immoveably fixed by the root, (*stirps radicata*); some of them, however, are capable of changing place, as the *Pennatula*, (*stirps vaga*).

Formerly Imperati and Gesner had remarked the animal structure of Corals; but, in modern times, Peyssonell was the first who discovered the living animals, and his discoveries have been confirmed by Reaumur, Jussieu, Trembley, Donati, Ellis, Baister, Pallas, and Linnæus.

Henry Baker, *Essays on the Natural History of Polyptes*. Lond. 1743, 8vo.

- M. Trembley, *Memoires pour servir a l'histoire d'une espece de Polypes d'eau douce.* Leyd. 1744, 4to.
- Donati, *Della storia naturale marina dell' Adriatico.* Venez. 1750, 4to.
- John Ellis, *Essay towards a Natural History of the Corallines and other marine productions found on the coasts of Great Britain.* Lond. 1755, 4to.
- Johi Baſteri, *Opuscula subſeciva; obſervationes quædam de animalculis et plantis marinis eorumque ovariis, &c.* Harlem 1759-65, 4to.
- P. S. Pallas, *Elenchus Zoophytorum, cum ſelectis auctorum ſynonymis.* Hag. Com. 1766, 8vo.
- John Ellis and Daniel Solander, *the Natural History of many curious and uncommon Zoophytes.* Lond. 1776, 4to.
- C. G. Ludwig, *Diſſertationes de vegetatione plantarum marinarum.* Lips. 1736, 4to.
- Joan F. Maratti, *de Plantis Zoophytis et Lithophytis.* Rom. 1776, 8vo.

GEN. LXXXVIII. TUBIPORA. The animal a Nereis. The Coral conſiſting of cylindric, hollow, erect, parallel, aggregated tubes.

*Tubipora muſica.* The tubes connected together in bundles, with tranſverſe, membranaceous, diſtant partitions.

*Inhabits* the American and Indian Oceans. B.

This Coral conſiſts of a number of perpendicular tubes, arranged like the pipes of an organ; it is of a fine red or purple colour; is fixed to rocks or other corals, and the tubes grow to be ſometimes three feet in diameter.

GEN. LXXXIX. MADREPORA. The animal a Meduſa. The Coral having cavities compoſed of lamellæ in a ſtar-like form.

The Corals of this genus are numerous, but they are all foreign except the following.

*Madrepora verrucaria.* The ſtar orbicular, flattiſh, and ſeffile; the diſc full of little cylindrical tubes, diſpoſed like rays; the baſe radiated.

*Inhabits* the Mediterranean and Northern Seas. B.

About the ſize of a ſplit pea; adhering to fuci, ſuſtra, &c. it is as it were a connecting link between the Madreporæ, Tubipore, and Millepore.

GEN

**GEN. XC. MILLEPORA.** The animal a Hydra.  
The Coral for the most part branched ; with turbinated, cylindrical pores.

1. *Millepora truncata*. Dichotomous and erect, with truncated branches. (Plate XII. fig. 7.)

*Inhabits* the Mediterranean and northern seas. B.

Of a greyish yellow colour, and covered with a sort of slime, very brittle, of an ash colour within, with pores arranged in the quincunx order. Has been found in the seas in the north of Scotland.

2. *Millepora cervicornis*. Somewhat compressed, dichotomous, with cells on both sides, with projecting tubular openings.

*Inhabits* the Mediterranean. B.

The branches of this Coral resemble a stag's horn ; it looks as if covered with varnish, and turns from red to a yellowish brown ; it grows to five or six inches high.

3. *Millepora Skenei*. Flat, compressed, somewhat branching, with cells on both sides in regular rows, alternate ; each with a helmet-shaped cover over its rounded gaping mouth ; the under lip furnished with a single tooth.

*Inhabits* Scotland.

Found adhering to a rock in the sea near Aberdeen ; of a bright, shining, white colour, as if covered with a silver varnish.

4. *Millepora fascialis*. Membranaceous, branching, bending irregularly, and porous on both sides.

*Inhabits* the Mediterranean. B.

This Millepore grows in irregular masses, of six inches diameter ; the branches coalesce, twist, and branch out again, leaving certain hollow spaces between them. A variety of it is found on the coast of Cornwall.

5. *Millepora foliacea*. With winding laminae, or plates, full of cells on both sides.

*Inhabits* the Mediterranean, B.

Common on the sea coast of Britain, in masses, from three inches to a foot long ; sometimes incrusting stones and shells.

6. *Millepora*

## MILLEPORA.

6. *Millepora cellulosa*. Membranaceous, reticulated, umbilicated, funnel-shaped, and waved; porous, and pubescent on one side.

*Inhabits* the Mediterranean, &c. B.

Adheres to rocks, fuci, and gorgoniae; three inches high, very brittle, though somewhat solid, and whitish; the pores in a quincunx order.

7. *Millepora polymorpha*. Crustaceous, of various figure, solid, and without pores.

*Inhabits* the Ocean. B.

The Coral of the shops; of different colours, from one inch to three inches long. It is used in many places, as at Falmouth, for manure.

8. *Millepora Alga*. With thin, semicircular laminae, that grow horizontally.

*Inhabits* England.

Found on the shores of Cornwall, adhering to the foregoing species; it is thin and brittle, of various colours, the plates of various sizes.

9. *Millepora pumicosa*. Of various figure, fragile, very rough, composed of pointed, sub-globose cells.

*Inhabits* the British seas.

Generally incrustating the fertulariae, in irregular lumps, consisting of an infinite number of small round cells, with a circular entrance.

10. *Millepora tubulosa*. Parasitical, with cells shaped like tubes, disposed in transverse rows.

*Inhabits* the Mediterranean and northern ocean. B.

Found surrounding the stalks of fuci, and the denticulated corallines; the tubes are almost parallel, and of a semi-transparent faint purple colour.

GEN. XCI. CELLEPORA. The animal a Hydra; the coral with small pitcher or bottle-shaped sub-membranaceous holes.

*Cellepora pumicosa*. Dichotomous, somewhat erect, sub-compressed, and rough. (Plate XII. fig. 16 .17.)

*Inhabits* the Indian, Atlantic, &c. seas. B.

The



**CELLEPORA.**

The entrance of the cells, which are globose, is guarded by spines, the surface of a spongy texture.

**GEN. XCII. ISIS.** The animal grows in the form of a plant. The coral is a stony articulated stem, the joints longitudinally striated, connected by a horny or spongy substance, and covered with a softer porous and cellular fleshy matter. The mouths filled with oviparous Hydreae.

*Isis Hippuris.* With a coral-like stem; the joints striated, the interstices attenuated.

*Inhabits the Ocean.*

This *Isis* has a jointed stony stem, which rises into many loose branches; the bone, or support of the animal, consists of white, cylindrical, stony, channelled joints, connected together by black, contracted, horny, intermediate ones. The flesh is whitish, plump, and full of minute vessels; the surface of it full of the little mouths of the cells, which are disposed in a quincunx order, covering polypes with eight claws. It is often brought from the straits of Sunda, seldom with the flesh on, as the sailors scrape it off to shew the black and white joints.

**GEN. XCIII. ANTIPATHES.** Black Coral. The animal grows in the form of a plant. The stem horny within, beset with very small spines, and spread out at the base; the outside covered with a gelatinous flesh, full of warts, out of which the polypi extend themselves.

*Antipathes spiralis.* With a single twisted rough stem.

*Inhabits the Indian Ocean.*

Of a hard, horny black, shining substance; brittle, almost as glass; it spreads itself with a broad face on a coral rock; the thickness of a quill, and sometimes seven feet long.

**GEN. XCIV. GORGONIA.** The animal grows in the form of a plant. Stem varies, and is either like leather,

## GORGONIA.

leather, cork, wood, horn, bone, shell, made of glassy fibres, or like stone ; it is striated, grows smaller at the ends as it rises upwards, and spreads out at the base ; covered with a softish flesh, full of small vessels and cells, and when dry becomes spongy, and friable ; the cells are furnished with little mouths, out of which the polypi extend themselves to procure nourishment, and send forth their spawn.

1. *Gorgonia Placensis*. Branching dichotomously, the branches bending towards one another, but seldom uniting ; the flowers or mouths conical, and projecting.

*Inhabits* Europe. B.

Found on the coast of Cornwall. Outside covered with a crust full of little lumps like warts ; on the coast of Norway it grows several feet high.

2. *Gorgonia verrucosa*. Dichotomous, with bending branches, and a whitish calcareous bark ; the mouths projecting.

*Inhabits* the Mediterranean and American seas. B.

Found on the coast of Cornwall ; it grows in a flat fan shape ; the mouths are like white prominent warts.

3. *Gorgonia anceps*. Sub-dichotomous, or growing like a panicle, with a compressed calcareous bark, porous at the margin.

*Inhabits* the American and British seas.

When this species is recent from the sea it is of a fine violet colour ; but afterwards turns yellow or white.

4. *Gorgonia nobilis*. True red Coral. Grows spread flat with dichotomous branches, that lessen towards their extremities ; flesh of the colour of vermilion, soft, slippery, and full of minute vessels. Mouths irregularly placed on the surface, rising in a conical form, consisting of eight valves, just opening, whence proceed polypes of a white colour, with eight

GORGONIA.

ALCYONID

eight arms; each arm having a double row of fibres on both edges. The stem is stony, of the brightest red, marked with minute furrows on the outside, and with little hollow places here and there, that have corresponded with the cells.

*Inhabits* the Mediterranean and Red Sea.

The true Coral grows, at the utmost, to the height of a foot. It is well known to us, particularly after having been deprived of its fleshy cover.

GEN. XCV. ALCYONIUM. The animal growing in the form of a plant. The stem fixed, fleshy, gelatinous, spongy, or leathery, having an outward skin full of cells, with star-like openings, or little mouths, sending forth tentaculated hydrae, through which the eggs are produced.

1. *Alcyonium digitatum*. Dead man's toes. Without any stalk, oblong, coriaceous, and wrinkled.

*Inhabits* the European ocean. B.

Often taken up by fishermen, when trawling for flat fish. The surface is full of small papillae, with a star of eight points on the top of each, and from each star there issues a hydra, with eight arms.

2. *Alcyonium Schlofferi*. Of a lead-coloured fleshy substance, with yellow stars, that have obtuse rays.

*Inhabits* England.

Found on fuci and stones, on the coast of Cornwall and Wales; it grows on other bodies; the rays of the stars are from 6 to 10, equal, and meeting at the base, where they are perforated.

3. *Alcyonium Bursa*. Sub-globose, of a pulpy substance, and green.

*Inhabits* the Mediterranean and English seas.

Of the bulk of a middle-sized apple; soft, with numerous transparent papillae.

4. *Alcyonium Ficus*. Obovate, pulpy, and livid.

*Inhabits* the Mediterranean and English seas.

Of a fleshy substance, and dark olive-colour, divided into flattish lobes which are covered with minute stars.

## ALCYONIUM.

5. *Alcyonium gelatinifera*. Of various figures, and of a jelly-like substance.

*Inhabits* the European Ocean. B.

Found frequently adhering to algae, sea, stones, corallines, and shells; of a yellowish colour; at particular seasons it is full of minute papillae, which send forth hydrac.

6. *Alcyonium eschschoides*. Crustaceous, and leathery, with scattered papillae, and two subdentated mouths.

*Inhabits* England.

Found on the coast of Cornwall, adhering to the *Fucus palmatus*, of a pale red; or whitish saffron colour, with warts having each a small double orifice of a rich crimson.

GEN. XCVI. SPONGIA. Sponge. The animal fixed, flexible, and varying in shape; very spongy; composed either of reticulated fibres, or masses of small spicula, interwoven together, which are clothed with a living gelatinous flesh, full of small mouths or holes on its surface, by which it sucks in, and throws out the water.

1. *Spongia coronata*. Tubular, simple, very small, surmounted at the top with a row of small spines.

*Inhabits* England.

A small species, when magnified covered all over with little rising points; of a pale yellow colour, the little crown of a shining pearl colour.

2. *Spongia officinalis*. Common Sponge. Full of holes, of various figure, somewhat branching, tough, and downy.

*Inhabits* the Mediterranean and Red seas.

The common sponge adheres to rocks by a very broad base; it is often found inclosing small stones and shells. It is chiefly collected about the Islands in the Archipelago, where it forms a considerable article of commerce.

3. *Spongia oculata*. Full of holes, much branched, erect

SPONGIA.

erect, and tough ; the branches roundish, and obtuse.

*Inhabits* the British seas.

Of a pale yellow colour, from 5 to 10 inches high ; often dichotomous ; the branches ending obtusely ; very common on all our shores.

4. *Spongia tomentosa*. Porous, sub-aculeated, and downy.

*Inhabits* the shores of Britain and America.

Very common on the coasts of these kingdoms, frequently growing round fuci ; full of papillae, or small protuberances, with a hole in each for sucking in, and throwing out the water. When viewed with a magnifier it appears composed of an infinite number of spicula, which, if rubbed on the skin, will raise blisters like cow-itch ; and this property is much increased if it be dried in an oven.

5. *Spongia stuposa*. Branched, round, soft like tow, and covered with fine pointed hairs.

*Inhabits* England.

Of a pale yellow colour, and about three inches high.

6. *Spongia cristata*. Flat, erect, and tender, with rows of little holes along the top, which project a little.

*Inhabits* England.

It adheres to rocks ; of a yellowish colour. "When taken out of the sea, says Ellis, and put into a glass vessel with sea water, I perceived it to suck in and squirt out the water through the rows of holes, giving evident signs of life."

7. *Spongia palmata*. Shaped like a hand, the fingers a little divided at top, with projecting pores irregularly disposed.

*Inhabits* England.

Of a reddish colour inclining to yellow, and of the same soft woolly texture with the *Spongia oculata*.

8. *Spongia botryoides*. Very delicate and branched, as if in bunches ; the bunches are hollow, in the shape of grapes, and each is open at top.

*Inhabits* England.

Of a bright shining white colour ; the bunches made up of oval oblong figures, open at the end.

9. *Spongia*

## SPONGIA.

9. *Spongia panicea*. Of no regular figure; whitish, soft, very tender, with minute pores.

*Inhabits* the British seas.

Interwoven with fuci, tubulariæ, and sertulariæ.

10. *Spongia lacustris*. Creeping on other bodies, and taking their figure; brittle, with erect, round, obtuse branches.

*Inhabits* England, Sweden, &c.

This species is found in lakes and rivers; it has a strong peculiar smell; when young flat, when old putting forth branches. In autumn it contains little globules, like seeds, which explode when put into the flame of a candle.

GEN. XCVII. FLUSTRA. Fixed to other bodies, and sometimes but rarely adhering to them by little radical tubes. Stem, a membranaceous leaf-like substance, consisting of many rows of cells united together, which spread out as they grow, and divide into many parts, the whole surface having the appearance of being wove like a matt. It sends forth, through the mouth-like openings of its cells, suckers or feelers, shaped like the fresh-water hydra; these are fixed at the bottom of each cell. The ovaries appear to be the pearl-like studs which are found at the tops of the cells.

1. *Flustra foliacea*. Leaf-like and branching; the laciniæ wedge-shaped, and rounded.

*Inhabits* the Northern ocean. B.

Very common on all our coasts, adhering by a stalk to shells, rocks, and various sub-marine substances; of a pale yellowish brown colour.

2. *Flustra truncata*. Leaf-like, and sub-dichotomous; the laciniæ linear and truncated.

*Inhabits* the European ocean. B.

A common species; of a pale yellow or brownish colour; the cells are open on both surfaces, and placed back to back, like the cells in a honey-comb.

3. *Flustra*

FLUSTRA.

1. *Flustra pilosa*. Leaf-like and variously branched ; with a setaceous dent at the bottom of each pore.

*Inhabits* the Northern ocean. B.

Found frequently, incrusting the smaller fuci, and now and then rising up into irregular leaf-like forms, with cells on both sides.

2. *Flustra chartacea*. Like paper, with cells on both sides ; the tops of the branches formed like the edge of an axe.

*Inhabits* England.

Thin, sub-pellucid, of a light straw colour ; sometimes digitated, with cells of an oblong square figure.

3. *Flustra carbacea*. Leaf-like and dichotomous, with a single layer of cells.

*Inhabits* Scotland.

Of a yellowish brown colour ; the middle of the cells almost transparent ; ovate above, the lower part of the sides contracted, at the base truncated.

4. *Flustra dentata*. Flat and leaf-like, growing on fuci ; the cells sub-oval and shining, consisting of a single layer ; their mouths surrounded by sharp teeth bending inwards.

*Inhabits* England.

This species is bright and shining, full of little dots or points ; it adheres to fuci and shells.

5. *Flustra bullata*. With projecting, white, egg-shaped cells, having little round mouths, armed with small spines.

*Inhabits* England.

Found surrounding the stems of fuci, or spread on their leaves.

6. *Flustra arenosa*. Formed of sand or slime into a crustaceous body, with small mouths placed almost in a quincunx order.

*Inhabits* England.

The *Alcyonium arenosum* of Dr. Shaw. Of a semicircular shape, and generally attached to the roots of the larger fuci. Its texture much slighter than that of most others of the genus ; the cells not deeply impressed, but rather superficial.

9. *Flustra*

## FLUSTRA:

9. *Flustra membranacea*. Flat and leaf-like, adhering to other bodies; with oblong quadrangular cells.

*Inhabits* England.

It adheres to stones, shells, and fuci; very thin; the cells pointed at the upper projecting angles.

GEN. XCVIII. TUBULARIA. The animal rooted and growing like a plant; the head with a crest of tentacula; generating little ova. The stem tubular, horny, either simple or branched, fixed at the bottom; the animal coming forth at the extremity.

1. *Tubularia indivisa*. With unbranched stems, twisted at the joints.

*Inhabits* the European ocean. B.

The Pipe Coralline, with single tubes growing in clusters together, is wider upwards, and narrower below, where the tubes are interwoven, one with another. It is the largest of the British Tubulariæ, and grows on rocks, shells, &c.

2. *Tubularia ramosa*. With branched stems, twisted at the joints.

*Inhabits* the European ocean. B.

It consists of numerous stems of a soft substance and grey colour; about two inches high.

3. *Tubularia fistulosa*. With dichotomous articulated stems, marked with rhomboid impressions.

*Inhabits* the European seas. B.

About three inches high, of the thickness of a coarse thread or thicker, and of a pale grey colour.

4. *Tubularia muscoides*. With sub-dichotomous stems, wrinkled with rings.

*Inhabits* the Mediterranean and European seas. B.

The Tubularia *Larynx* of Ellis and Solander, so called from its being wrinkled like the wind-pipe. It is found in plenty adhering to other marine bodies, or to the bottoms of ships; the top of each tube bears a crimson-coloured hydra, equal in richness of colour to the Guernsey lily.

5. *Tubularia Coryna*. Somewhat branched, filiform, of a substance like paper; gepiculated; terminating



**TUBULARIA.**

in oval, acuminated capsules, perforated with a dilatable mouth, and with cylindrical tentacula.

*Inhabits* the Belgic and English shores.

Adheres to fuci and *sertulariæ*; of a reddish colour; narrower at the base than at the top; neither the head nor the tentacula retractile.

6. *Tubularia affinis*. Simple, sub-annulated and soft; the tentacula attenuated; and surrounding a mouth formed like a papilla.

*Inhabits* England.

Akin to the foregoing species; the capsules with muricated tentacula, often bearing eggs at the base.

7. *Tubularia flabelliformis*. With small parallel fasciculated tubes; the fasciculi disposed in a radiated form.

*Inhabits* England.

Found at Milford Haven on the *Conserva rubra*. Given from the Linnæan Transactions, Vol. V. its origin is a simple cylindrical stem, affixed at its base, which is a little dilated to the stems of the *conserva*, and then abruptly becomes dilated into a fan-shaped compressed body, from which proceed eight rays.

- GEN. XCIX. CORALLINA.** The animal growing in the form of a plant; the stem fixed to other bodies, and composed of capillary tubes, whose extremities pass through a calcareous crust, and open into pores on the surface. The branches are often jointed, and always subdivided into smaller branches; which are either loose and unconnected or joined as if glued together.

The animal inhabitant has not hitherto been clearly demonstrated in the species of the genus *Corallina*; but that they have such inhabitant is inferred from their calcareous nature, and from their great affinity to some of the species of *Millepora*.

1. *Corallina squamata*. Trichotomous, with different shaped joints: those of the stem roundly compressed and wedge-shaped; those of the branches flatly com-

## CORALLINA.

compressed; those at the extremities flattish, going off sharp on each side, like a two-edged sword.

*Inhabits* England.

Found on the coast of Cornwall; of a sea-green colour.

2. *Corallina elongata*. Trichotomous, with the joints of the stem of a roundish wedge-shape; of the branches cylindrical; of the tops a little blunt, and knots on some of them.

*Inhabits* England.

Found on the coast of Cornwall; of a reddish or purple colour; more slender than the *officinalis*.

3. *Corallina officinalis*. Common Coralline. Nearly doubly pinnated; the joints somewhat turbinate.

*Inhabits* the European and Mediterranean seas. B.

Common on all our coasts; varying in colour, red, greenish, yellowish, and white.

4. *Corallina rubens*. Dichotomous, capillary, and growing in bundles; the uppermost articulations elevated.

*Inhabits* England.

About two inches long; of a red colour, and has the look of a Conferva.

5. *Corallina cristata*. Filiform, dichotomous, and growing in bundles; the articulations cylindrical, and those of the upper divisions clavated.

*Inhabits* the Northern and American oceans. B.

An elegant little Coralline; about an inch, or an inch and a half long; of a red colour, sometimes green or white. It is easily known, by being disposed into crest-like tufts.

6. *Corallina spermophoros*. Dichotomous, capillary, pinnated below; the joints cylindrical.

*Inhabits* England.

Generally of a white colour; hardly more than an inch long.

7. *Corallina corniculata*. Dichotomous, pinnated below, the joints with two horns.

*Inhabits* England.

Found on the coast of Cornwall; it has ovaries at the angles of the upper divisions.

GEN. C. SERTULARIA. The animal growing in the form of a plant. The stem emitting Hydræ out of cells, or cup-shaped denticles.

The species of this genus grow on other bodies, as fucus shells, stones, rocks, &c. ; they are for the most part delicate and tender, and the young animals must be viewed when alive with a magnifier.

\* Stem tubular and horny, set round with cup-shaped denticles, fixed at the base, furnished with vesicles which contain hydræ, ova or living young.

1. *Sertularia rosacea*. Lily flowering S. Growing in the form of a panicle ; the denticles opposite, tubular, and truncated ; the branches alternate ; the vesicles crowned with little spines.

*Inhabits* the European and Mediterranean seas. B.

Delicate, white, and tender ; growing on shells, and often climbing up other Corallines.

2. *Sertularia pumila*. Sea-Oak S. The denticles opposite, pointed, and bent back ; the ovaries obovate ; the branches irregular.

*Inhabits* the Ocean. B.

Frequent on the *Fucus ferratus*. This species, and probably many others, in some particular states of the atmosphere, give out a phosphoric light in the dark. If a leaf of the above fucus with the *Sertularia* upon it, receive a smart stroke with a stick, the whole Coralline is most beautifully illuminated, every denticle seeming to be on fire.

3. *Sertularia operculata*. Sea-hair S. The denticles opposite, pointed, and erect ; the vesicles obovate, with a lid ; the branches alternate.

*Inhabits* the American, &c. seas. B.

Attached to shells, seldom to fuci ; neat and regularly formed ; the slender branches grow in tufts like bunches of hair.

4. *Sertularia tamarisca*. Sea Tamarisc S. The denticles nearly opposite ; with two or three truncated dents ; the vesicles obovate and bidentated, the branches alternate.

*Inhabits* the Northern sea. B.

## SERTULARIA.

Grows upon shells; the largest of the genus; near four inches long.

5. *Sertularia abietina*. Sea-Fig S. The denticles nearly opposite and tubular; the vesicles oval, the branches pinnated, the pinnæ alternate.

*Inhabits* the Mediterranean sea. B.

Adheres to oyster and muscle shells; very common; from four to five inches high.

6. *Sertularia fuscescens*. Pinnated and brownish; with tubular little cups nearly opposite, and numerous small vesicles, turned one way, with three tubercles on each.

*Inhabits* the coast of Cornwall.

7. *Sertularia cupressina*. Cypress S. The denticles nearly opposite, alternate, and somewhat acute; the vesicles obovate; the branches paniculated, and very long.

*Inhabits* the European ocean. B.

Found in deep water on the coasts of Yorkshire and Scotland.

8. *Sertularia argentæa*. Squirrels-tail S. The denticles nearly opposite and pointed; the vesicles oval; the branches alternate and paniculated.

*Inhabits* the European and American oceans. B.

Very common; resembling a branched geniculated Con-  
ferva.

9. *Sertularia rugosa*. Snail-trefoil S. The denticles alternate and obsolete; the vesicles much furrowed, with three dents at the opening of each; the branches irregular.

*Inhabits* the European ocean. B.

Adheres to the *Flustra foliacea*, and to other Corallines.

10. *Sertularia halecina*. Herring-bone S. The denticles alternate and obsolete; the cups with two joints; the vesicles oval; united along the side to a little tubular stalk.

*Inhabits* the European and Mediterranean seas. B.

Adheres to oyster shells; of a horny or grey colour, and grows to be six or eight inches high.

SERTULARIA.

11. *Sertularia Thuja*. Bottle-brush S. With two rows of denticles, adhering alternately to both sides of the branches; the vesicles obovate with a margin; the stem with two rows of branches ending dichotomously.

*Inhabits* the Northern and Mediterranean seas. B.

It grows to be half a foot long; but is not common.

12. *Sertularia Myriophyllum*. Pheasant's-tail S. The denticles turned one way, and acute; the vesicles turned one way, cylindrical, and imbricated; the twigs semi-pinnated and incurved.

*Inhabits* the Ocean. B.

This *Sertularia* is different from any other, on account of certain arched knots on its stem.

13. *Sertularia falcata*. Sickle S. The denticles turned one way, imbricated, and truncated: the vesicles ovate; the branches pinnated and alternate.

*Inhabits* the Ocean. B.

A common kind adhering to shells and rocks; rising into erect waved stems, with pinnated branches bending in the form of a sickle.

14. *Sertularia Pluma*. Podded S. The denticles turned one way, imbricated, and companulated; the vesicles gibbous and cristated; the twigs pinnated, alternate, and lanceolated.

*Inhabits* the Ocean. B.

Generally found climbing upon fuci, particularly the *Fucus filiquosus*, round the stem of which, its little tubulous radicles twine in circles.

15. *Sertularia antennina*. Lobster's-horn S. The denticles verticillated, four in the whirl, and setaceous; the vesicles obliquely truncated, and verticillated; the stems in general unbranched.

*Inhabits* the Ocean. B.

Sometimes nearly a foot long; there is a variety of it with branched stems.

16. *Sertularia verticillata*. Horse-tail S. The denticles obsolete, the vesicles bell-shaped, denticulated, and erect;

## SERTULARIA.

erect; with very long twisted peduncles, four in a whirl.

*Inhabits the Ocean.* B.

With glutinous denticles; tender and fragile; several inches long.

17. *Sertularia gelatinosa*. Glutinous, with sand adhering to it, and much branched; the branches doubly compound, divaricated, and scattered; the little cups bell-shaped.

*Inhabits the European ocean.* B.

18. *Sertularia volubilis*. Small climbing S. The denticles obsolete; the vesicles bell-shaped, dentated, and alternate; the peduncles very long, twisted, and solitary.

*Inhabits the Ocean.* B.

Adhering to other Corallines, Flustræ, or Fuci; tender and whitish.

19. *Sertularia Syringa*. Creeping S. The denticles obsolete; the vesicles cylindrical, pedunculated, and intire.

*Inhabits the European ocean.* B.

Adheres to other Corallines and shells; of a yellowish colour.

20. *Sertularia Cuscuta*. Climbing Dodder-like S. The denticles obsolete; the vesicles ovate, placed on the inside at the insertion of the branches; the branches single and opposite.

*Inhabits England.*

Adheres to fuci.

21. *Sertularia pustulosa*. Dichotomous, tubular, and jointed; alternately, but thinly branched; the upper part of the joints obscurely denticulated.

*Inhabits England.*

Found in the Isle of Wight; tender; four inches long.

22. *Sertularia frutescens*. Shrubby S. Branching, tubular, and pinnated; the pinnulæ setaceous, alternate and bending upwards; the denticles turned one way, cylindrically bell-shaped.

*Inhabits England.*

**SERTULARIA.**

More firm and woody than others of this genus ; the stem black, and hard ; the branches dark brown.

23. *Sertularia Filicula*. Fern S. Much branched, and pinnated ; the stem bent to and fro, into alternate angles, from which angles little branches are produced ; the denticles are oval, and tubulated ; in each axilla, or part, whence the little branches come out, is an erect single denticle.

*Inhabits* England.

Very delicate. Somewhat resembles the *S. abietina*.

24. *Sertularia Evansii*. Evans's S. With opposite branches, and short denticles placed opposite : the vesicles are lobated, and arise from opposite branches, which proceed from the creeping adhering tube.

*Inhabits* England.

About two inches high, creeping on fuci, very slender, and of a bright yellow colour.

25. *Sertularia muricata*. Sea Hedge-hog S. Jointed, with denticles on foot stalks, proceeding alternately from the joints ; the vesicles globular, full of points, from crested ribs, sitting on foot-stalks, and arising from root-like tubes.

*Inhabits* Scotland.

26. *Sertularia Uva*. Grape S. Somewhat branched, with obsolete denticles ; the vesicles ovate, and in clusters ; the branches irregular.

*Inhabits* England.

Adhering to other corallines and fuci ; with transparent vesicles, having a white nucleus.

27. *Sertularia lendigera*. Nit S. With obsolete denticles ; the little cups turned one way, cylindrical, parallel, here and there gathered together in clusters ; the stems filiform.

*Inhabits* the British seas.

Adheres to fuci, and to other zoophytes.

28. *Sertularia geniculata*. Knotted sea-thread S. The denticles alternate, and twisted ; the vesicles obovate

## SERTULARIA.

vate, with a kind of beak; the stem geniculated, and bent.

*Inhabits* the northern and Mediterranean oceans. B.  
Adheres generally to the *Fucus vesiculosus* or sea oak.

29. *Sertularia dichotoma*. Sea-thread S. The denticles obsolete; the vesicles obovate, and placed at the insertion of the branches; the peduncles are twisted, the stem dichotomous, and geniculated.

*Inhabits* the Northern and Mediterranean oceans. B.  
Sometimes a foot long: the young are whitish, the old testaceous.

30. *Sertularia spinosa*. Silk S. The denticles obsolete; the little cups ovate, and subulated; the branches dichotomous and spiny.

*Inhabits* the European and Mediterranean seas. B.  
Sometimes eight inches long.

31. *Sertularia pinnata*. Sea bristle S. The denticles obsolete; the vesicles oblong; the stem unbranched, pinnaed, and lanceolated.

*Inhabits* the English and Indian seas.  
The vesicles are clustered; three inches high.

32. *Sertularia fetacea*. Little sea-bristle S. Simple, and pinnated; the pinnae alternate, and sub-incurved; the denticles obsolete, very remote, and turned one way; the vesicles oblong, tubular, and rising at the insertion of the branches.

*Inhabits* the Northern and Mediterranean seas. B.  
About one inch and a half high; like the preceding, but one half slenderer, and more common.

33. *Sertularia polyzonias*. Great tooth S. The denticles alternate, and sub-denticulated; the vesicles obovate, with several lines across, the stem branched.

*Inhabits* the sea. B.  
It grows erect, sending out spreading branches about two or three inches high.

34. *Sertularia Lichenastrum*. Sea Spleen-wort, or Poly-pody. The denticles obtuse, in two rows, and imbricated; the vesicles obovate, turned one way,  
and



## SERTULARIA.

and parallel ; the stem pinnated ; the branches dichotomous.

*Inhabits* the Indian and Irish seas. B.

Found in the harbour of Dublin. Grows in an alternately pinnated form, somewhat like the leaves of Polypody.

•• *The stem crustaceous, lapideous, composed of cells in rows, with no distinct ovaries, but little balls in their stead.*  
Cellaria.

35. *Sertularia Burfaria*. Shepherd's Purse S. The denticles opposite, compressed, and even at top ; the branches dichotomous.

*Inhabits* England.

Adheres to fuci ; minute, flexible, and transparent.

36. *Sertularia loriculata*. Coat of Mail S. The denticles opposite, obliquely truncated, and obsolete ; the branches dichotomous and erect.

*Inhabits* England.

About an inch and a half long ; often twining round aged Sertulariæ.

37. *Sertularia fastigiata*. Soft feathered S. The denticles alternate, and acute ; the branches dichotomous, erect, and fastigiated.

*Inhabits* England.

38. *Sertularia avicularia*. Birds-head S. The denticles turned one way, nearly opposite, with beak-like appendages ; the little cups globose, pointed, and sessile ; the branches continuous, and dichotomous at top.

*Inhabits* England.

39. *Sertularia neritina*. Snail-bearing S. The denticles alternate, turned one way and acute ; the branches dichotomous, unequal, and erect.

*Inhabits* the Mediterranean and American seas. B.

Soft ; with a double row of cells.

40. *Sertularia scruposa*. Creeping stony S. The denticles alternate, angular and spiny ; with dichotomous creeping branches.

*Inhabits* the Indian, American, &c. seas. B.

Very

## SERTULARIA.

Very tender, linear, and pale; with a double row of cells.

41. *Sertularia reptans*. Creeping S. The denticles alternate, with two teeth; the branches dichotomous, and creeping.

*Inhabits* the European seas. B.

Adhering to the *Flustra foliacea*, and *fuci*; allied to the foregoing species.

42. *Sertularia ciliata*. Ciliated S. The denticles alternate, ciliated, funnel-shaped, with erect dichotomous branches.

*Inhabits* the English and Norwegian seas. B.

Growing upon other *Sertulariæ*, *fuci*, and *spongiæ*; whitish; from four to five lines high.

43. *Sertularia eburnea*. Tufted Ivory S. With alternate, truncated cells, a little prominent, with roundish vesicles, that have a tubular opening on one side; the branches spreading and jointed.

*Inhabits* the European and Mediterranean seas. B.

Adheres to other marine bodies; white, about an inch high.

44. *Sertularia cornuta*. Goats-horn S. The denticles alternate, truncated, and accompanied with a spine; the vesicles gibbous, with a beak; the branches alternate.

*Inhabits* the European and Mediterranean seas. B.

Strong and very white; scarcely four lines long.

45. *Sertularia loricata*. Bulls-horn S. The denticles turned one way, and linked together; the mouth with a sort of horn below; the branches alternate.

*Inhabits* the English and Mediterranean seas. B.

Adheres to *Gorgoniæ*, *fuci*, &c. small and glassy.

46. *Sertularia anguina*. Snake S. Without denticles: the twigs simple, clavated and obtuse; the aperture lateral.

*Inhabits* the Northern and Mediterranean seas. B.

White, very soft and flexible; climbing upon *fuci*, and other marine bodies, connecting, as it were, the genus *Sertularia* with the *Hydra*.

47. *Sertularia ternata*. Three celled S. Branched, dichotomous,

**SERTULARIA.**

dichotomous, pointed, and creeping ; the joints angulated, and somewhat shaped like a top ; with three cells in the front of each.

*Inhabits* Scotland.

Stony, and semi-transparent.

48. *Sertularia imbricata*. Somewhat branched ; the vesicles sub-clavated, at top irregularly imbricated.

*Inhabits* England.

Given from the Linnæan Transactions, Vol. V. Found on the *Fucus nodosus*. Height from one to three inches. Young shoots closely imbricated to their base, but older ones often naked.

**GEN. CI. PENNATULA.** Sea Pen. An animal that swims freely about in the sea, of many shapes, having a bone in the inside to support it. The lower part of the stem is bare ; from the upper part it sends forth hydræ, with radiated tentacula, through which the eggs are produced.

The animals of this genus send forth a strong phosphoric light in the sea ; they differ from the other Zoophytes in not being fixed, but swimming freely about.

*Pennatula phosphorea*. British Sea Pen. The stem fleshy ; the mid-rib between the fins rough, the fins imbricated.

*Inhabits* the Ocean. B.

Of a bright red colour, about four inches long ; found near Aberdeen, and on other places of the coasts, sticking to the fishermens lines, especially when they use muscles for bait.

**GEN. CII. HYDRA.** Polypus. An animal fixed by the base, and capable of contracting itself. The mouth is at the extremity, and is surrounded with tentacula.

Gmelin has included in this genus some animals that were formerly considered as belonging to that of *Actinia*.

## HYDRA.

\* *Sea Animals ; fleshy, oblong, cylindrical, oviparous ; the mouth dilatable.* Aëtinia, Ellis.

1. *Hydra Cereus.* With numerous tentacula, which it cannot contract ; the body striated, or furrowed, lengthways.

*Inhabits* England.

Found on the coast of Cornwall ; brown ; the tentacula of a beautiful sea-green, ending at the points in a lively rose-colour.

2. *Hydra Bellis.* With a head like the calyx of a flower, having many variegated tentacula, which it draws in ; the body covered with warts.

*Inhabits* England.

Found on the coast of Cornwall. Stem smooth, the tentacula almost transparent, of different lengths and colours. The disc is formed like a star composed of variegated rays.

3. *Hydra gemmacea.* With a disc surrounded by semi-transparent tentacula, which it has the power of drawing in. Body striated lengthways, with thousands of little glands.

*Inhabits* England.

Found on the coast of Cornwall ; and only to be met with in the fissures of the rocks.

4. *Hydra Mefembryanthemum.* With a disc surrounded with tentacula, which it has the power of drawing in ; the outward margin of the disc has a row of tubercles.

*Inhabits* England.

In summer it is red ; in autumn it changes to a dark-green or brown.

5. *Hydra Dianthus.* Smooth, and nearly cylindrical, the disc divided into five leaf-like figures, which are adorned with many minute white tentacula surrounding the mouth, which is elevated and striated.

*Inhabits* England.

Has the appearance, when the tide is out, of a slender, long-stalked, yellow fig.

\*\* *Inhabits*!

**HYDRA.**

*\*\* Inhabitants of fresh waters ; changing place, linear, gelatinous, naked, with setaceous antennæ; producing young from their sides, which fall off.*

5. *Hydra viridis*. The Polypus. With about ten short tentacula. (Plate XII. fig. 4.)

*Inhabits Europe. B.*

This is one of those most remarkable animals called Polypi, so famous for their power of reproduction. They may be cut longitudinally, transversely, or diagonally, and in a few days the separate parts will become perfect animals; they may be cut into six pieces, or turned inside out like a glove, still they live, and recover their original shape. The present species may be found from May to September in gently flowing streams, or in ditches, attached to aquatic plants. When at rest the tentacula are spread out every way in search of food; but when disturbed, or taken out of the water, the animal appears like an unformed gelatinous green mass.

7. *Hydra fusca*. With about eight very long tentacula.

*Inhabits Europe. B.*

Of a greyish brown colour, sub-attenuated before, the tentacula very slender, setaceous, and whitish.

8. *Hydra grisea*. The common Polypus. With about seven long tentacula.

*Inhabits Europe. B.*

This species is often found with us, but is very small. The number of tentacula, though made a specific character, is probably accidental, for this species sometimes has twelve; it is found in ditches, on water plants, such as the *Sium latifolium*, &c.

§ 284.

**ORDER V. INFUSORIA.**

THE Infusory animals make the last Order of this Class, and consequently the last division of the Animal Kingdom; they are found in water, or in the infusions made with vegetable or animal matters. Most of them are invisible to the naked eye, or appear but as moving atoms; but by the help of a magnifier, we can fully satisfy

J. C. Eichhorn, Beiträge zur Naturgeschichte der kleinsten Wassertiere. Danzig. 1774, 84, 4to.

L. Spallanzani, Tracts on the nature of animals and vegetables. Edin. 1799, 8vo.

George Adams, Observations on the Microscope. Lond. 1799, 4to.

O. F. Muller, Vermium terrestrium et fluviatilium, seu animalium infusoriorum, &c. succincta historia. Haun. 1773, 4to.

Animalcula infusoria, fluviatilia et marina, quæ detexit, systematicè descripsit et ad vivum delineari curavit O. F. Muller. Opus posthumum. Cura O. Fabricii. Haun. 1786, 4to.

GEN. CIII. BRACHIONUS. Body contractile, covered with a shell ; with rotatory cilia.

*Brachionus urceolaris*. Shell at the apex with many dents, at the base none ; the tail simple.

*Inhabits* stagnant waters.

Very common, particularly in August, and is visible with the naked eye like a whitish moving point ; it is both oviparous and viviparous ; the cilia hooked. When magnified it appears of an ovate shape, with six dents at the apex ; an incisure at the base, and a long tail ending in a cleft with two sharp points.

GEN. CIV. VORTICELLA. Body contractile and naked ; with rotatory cilia.

1. *Vorticella polymorpha*. Of many shapes ; green and opake.

*Inhabits* streams and rivers.

Appears to the eye like a green bristly moving point ; but under the microscope, puts on so many different appearances, that Muller says, of all the wonders of Nature that had occurred to him, this was the most astonishing. Its figure is at times globular, ventricose, cylindrical, or pear-shaped ; it, at other times, resembles a club, a tube, a cup, or a hood ; sometimes it is obtuse, sometimes acute ; its motion is sometimes swift, sometimes slow ; sometimes straight, sometimes bent or rotatory like a wheel, &c. ; and sometimes it fixes itself on its little pedicle and remains at rest.

2. *Vorticella rotatoria*. The wheel animalcule. Cylindrical ; the rotatory organ double.

*Inhabits* stagnant waters.

**VORTICELLA.**

This animal must be known to every one who has used the solar microscope. It is frequent in stagnating and putrid waters, particularly in spring and autumn; the motion of the heart and intestines is visible. Fontana says, it will revive after being kept dry for two years; but Muller never could succeed in reviving it, though he often made the experiment, when the water had been dry for two minutes.

**GEN. CV. TRICHODA.** Invisible to the naked eye, pellucid, hairy on one side.

*Trichoda Cometa.* Spherical, hairy before, with a globule behind. (Plate XII. fig. 15).

*Inhabits* the purest water.

Found in August; it has a little globule, and sometimes two appended to it, by a very slender thread; the smaller one soon disappears. In its motions it very much agitates the hairs on its fore-part.

**GEN. CVI. CERCARIA.** Invisible to the naked eye, pellucid, with a tail.

*Cercaria Cyclidium.* Oval, somewhat emarginated behind; with a tail which can be exerted.

*Inhabits* pure water.

An oval, flat, membranaceous, and very pellucid corpuscle, with a blackish rim; it moves to and fro in an acute angle, and in general goes diagonally through the drop in which it is contained.

**GEN. CVII. BURSARIA.** Very simple, membranaceous, and hollow.

*Bursaria Hirundinella.* Excavated, and pointed at both ends.

*Inhabits* stagnant waters.

Invisible by the naked eye; when magnified, it appears a transparent membrane, excavated in the middle, with four laciniae on the margins, of which the two lateral ones are equal and short; the anterior and posterior unequal, and longer. In July and August it is found in wet places in woods, near the Lemna.

**GEN.**

GEN. CVIII. GONIUM. Invisible by the naked eye, and very simple; flattened and angulated.

*Gonium pectorale.* Quadrangular, pellucid, consisting of sixteen spherical globules.

*Inhabits* pure water.

This curious animal consists of sixteen somewhat oval bodies, almost equal in size, greenish, pellucid, of a quadrangular figure, but not exactly so, as the angles are in some degree truncated. Its animal nature is discovered by its voluntary motions.

GEN. CIX. COLPODA. Invisible by the naked eye; very simple, pellucid, flattish, and sinuated.

*Colpoda Meleagris.* Changeable; on the fore part hooked, the hind part folded up.

*Inhabits* waters covered with the Lemna.

This animal is among the largest of the genus, but is not common; it moves slowly, folding itself in various ways, like the animals of the genus Planaria; the fore-part is quite transparent, the hind part filled with molecules.

GEN. CX. PARAMECIUM. Invisible to the naked eye; simple, pellucid, flat, and oblong.

*Paramecium Aurelia.* Oblong; on the fore-part longitudinally folded.

*Inhabits* ditches covered with the Lemna.

Found common in June; and likewise in vegetable infusions frequent; it moves quickly in right lines, from side to side; it remains several months in the same water.

GEN. CXI. CYCLIDIUM. Invisible to the naked eye; very simple, pellucid, flattish, orbicular, or ovate.

*Cyclidium Glaucoma.* Ovate, the intestines with difficulty visible.

*Inhabits* putrid water.

Its motion, where there is plenty of water, is circular, and diagonal, like that of the Gyrinus *Nator*. It is found in water,



**CYCLIDIUM.**

water, without any vegetable infusion, which has stood during the winter for more than six months in an open vessel.

**GEN. CXII. VIBRIO.** Invisible to the naked eye; very simple, round, and long.

**Vibrio aceti.** The Vinegar Eel. Somewhat rigid; with a long slender pointed tail, and a retractile spine prominent at the base.

*Inhabits* Vinegar and other mild acids.

These animals, when vinegar has stood some time exposed to the air, may be seen with the naked eye. They are said to revive after the vinegar has been frozen, but never after it has dried up; they cast their skin. In July and August they are viviparous, afterwards oviparous. A variety of this species is found in paste; one in fresh, and another in salt water.

**GEN. CXIII. LEUCOPHRA.** Every where surrounded with whitish cilia, which, when in motion, shine like silver. Invisible to the naked eye.

**Leucophra fluida.** Somewhat kidney shaped and ventricose.

*Inhabits* the juice of the common Muscle.

It is yellowish, thick, stuffed with molecules, of a changeable shape, ovate, oblong, or triangular.

**GEN. CXIV. BACILLARIA.** Body composed of little pieces like sticks or straws placed parallel, but varying their position.

**Bacillaria paradoxa.**

*Inhabits* the Ulva latissima.

This wonderful Animalcule consists of from five to forty or more short cylindrical pieces, their length about twelve times their breadth, filled within with a yellowish membrane, marked with two or three lucid scattered dots; when the animal is at rest, these little pieces are joined together so as to form a sort of square, but, at its pleasure, they are stretched out so as to form a straight line or an angulated figure,

## BACILLARIA.

always, however, preserving their parallelism. Muller, who, discovered it, calls it the *Vibrio paxillifer*.

GEN. CXV. ENCHELIS. Invisible to the naked eye, very simple and cylindrical.

*Enchelis Seminulum*. Cylindrical and equal:

*Inhabits* water which has been kept for some days.

Its motion is an alternate ascending and descending; it is about double the length of its breadth; the intestines are pellucid on the fore part, dark behind.

GEN. CXVI. VOLVOX. Invisible by the naked eye; very simple, pellucid, and spherical.

*Volvox Globator*. Spherical and membranaceous. (Plate XII. fig. 12 and 13).

*Inhabits* stagnant waters.

A very common animalcule, and sometimes so large as to be visible by the naked eye. It is every where to be found in spring and summer, and in water with an infusion of hay also in winter; it is green, but grows whitish or yellow, and is generally filled with globulets of a vivid green colour; these globulets contain other globulets, and these again still others, which are the young, so that the parent animal may be said to bear children, grand-children, and great grand-children at one time. It moves in all directions; at the same time rolling or spinning as if on an axis.

GEN. CXVII. MONAS. Invisible to the naked eye; simple, pellucid, like a point.

*Monas Lens*. Transparent.

*Inhabits* every sort of water.

Under the microscope these animalcules appear in myriads in a single drop of water; their figure is between spherical and ovate. Their motion is at first tremulous, and in the same spot; then they walk slowly; at last they become lively, and dart through the whole expanse. They are not often found in very pure water; but, in animal and vegetable infusions with fresh or sea water, there are myriads of them in every drop; and in the film which adheres to the teeth, they appear

**MONAS.**

appear of various sizes: Contrary to the custom of other infusory animals which crowd to that part of the drop where most water remains; these gather together at that side where the evaporation is most advanced, and there meet their death.

*QUELLE magnificence dans le plan de la creation terrestre !  
 quelle grandeur ! quelle profusion !  
 quelle complaisance à organiser la matiere,  
 et à multiplier les etres sentants !  
 Nous voyons les animaux répandus  
 sur toute la surface de la terre,  
 dans toute l'étendue des eaux,  
 et jusques dans les vastes contours de l'atmosphère.  
 La Mitte, comme l'Elephant ;  
 le Puceron, comme l'Autruche ;  
 le Vibrio comme la Baleine, ne sont qu'un composé d'animaux ;  
 toutes leurs liqueurs en fournissent ;  
 tous leurs vaisseaux en sont semés !*

**BONNET.**



## TERMS used in ENTOMOLOGY.

### A

**ABBREVIATA**, elytra, shorter than the abdomen.

—, fascia, not extending above half over the wing.

**Abdomen**, that part of the body distinct from the thorax, forming the hinder part of the insect and consisting of segments or rings.

**Achivi**, a subdivision of the genus *Papilio*, containing those species of the section *Equites* which have no bloody spots on them; but an ocellum at the inner angle of the posterior wings.

**Aculeatæ**, antennæ, thorax &c. armed with small sharp points.

**Acultato-ferratæ**, antennæ, set thick with prickles turned towards the apex.

**Aculeaco-unicinatæ**, antennæ, set with hook-shaped prickles.

**Aculeus**, the sting, an elongated sharp dart, often poisonous seated in the extremity of the abdomen.

**Acuminatæ**, alæ, terminating in a subulated apex.

**Acuminato-setacæ**, antennæ, terminated with a stiff sharp-pointed hair.

**Acutum**, rostrum, the point forming an acute angle.

**Adscitæ**, a division of the genus *Sphinx*, containing such species as differ in habit from the true or legitimate Sphinges, and whose larvæ are likewise different.

**Acquale**, abdomen, of the same breadth with the thorax.

**Alæ**, the wings, the instruments of flight.

— **gymnoptera**, membranaceous and transparent, without scales.

*æ primores*, the anterior or upper wings in the order Lepidoptera.

— *secundariæ*, the posterior or under wings, in the order Lepidoptera.

*ucitæ*, a division of the genus *Phalæna*, including those with digitated wings, that is, split to the base.

*nphi-opthalmæ*, *antennæ*, wholly or in part surrounded by the eyes.

*astomosans*, *striga*, observing the course of the nerves.

*agulatæ*, *alæ*, the posterior margin having prominent angles.

*agulatum*, *caput*, the margin cornered.

*agulus ani*, the posterior angle of the inferior wings.

*agulus posticus*, that extremity of the wing which is opposite to the base and to the apex.

*agustata*, *elytra*, narrower than the back.

*inularis*, *maculæ*, round, the middle of the same colour with the rest of the wing.

*tennæ*, two slender bodies placed upon the head, for the most part articulated, crustaceous, and serving as organs of a sense to us unknown.

*æx*, *alæ*, the part opposite to the base, terminating the anterior margin.

*æx*, *elytræ*, the part at the extremity of the abdomen.

*proximatæ*, *antennæ*, close together at the base.

*proximati*, *oculi*, close together.

*tera*, the name of an order of Insects including those which have no wings.

*terus*, *Curculio*, *Tenebrio*, *Meloe*, such species of these genera as want wings, the *elytra* being generally close, not separable.

*cuatum*, *rostrum*, bent like a circular arch.

*ristatæ*, *antennæ*, furnished with a compressed lateral knob, having attached to it a short beard or bristle, as in some species of *Musca*.

*ristata*, *cauda*, terminating in a bristle or slender thread.

*rticulatæ*, *antennæ*, with distinct joints or articulations.

*rtus*, the various instruments of motion, viz. the wings, the feet, the tail and the pectines.

*tonus*, a very minute dot, or point.

*taci*, a division of the genus *Phalæna*; they have spreading wings which incline downwards.

*tenuatum*, *caput*, *elytron* &c. blunt at the base, growing narrower at the apex.

*tenuatum posticè*, *caput*, blunt at the apex, growing narrower at the base.

Aurelia,

*Aurelia*, formerly applied to that sort of Pupa which is of a golden colour.

## B

*Barbatæ*, antennæ, tufts of hair at the articulations.

*Barbatum*, abdomen, tufts of hair at the sides or extremity.

*Basis*, alæ, the part by which it is connected with the thorax.

— *elytræ*, the part next the thorax.

— *femorum*, the part next the body.

*Bicaudatæ*, alæ, the hinder wings having two projecting processes.

*Bini oculi*, one eye on each side of the head.

*Bipupillatus*, ocellus, with two pupils.

*Bifeta*, cauda, having two slender attenuated setæ.

*Bivalve*, rostrum, consisting of two concave valves, united so as to form a tube.

*Bombyx*, a division of the genus *Phalæna*, including those with incumbent wings and pectinated antennæ.

*Brachyura*, with a tail shorter than the body.

*Breve*, rostrum, shorter than the head.

*Breves*, antennæ, shorter than the body.

*Brevirostris* *Curculio*, with a rostrum shorter than the head.

## C

*Calcareo-crustaceum*, integumentum, crustaceous and of a somewhat calcareous substance.

*Canaliculatum*, caput, with one or more deep hollow lines.

*Canaliculatus*, thorax, with a deep longitudinal groove in the middle.

*Capitatæ* antennæ, clavated, ending in a knob.

*Carinatus*, thorax, the middle part of the disc raised into a straight longitudinal ridge.

*Catophthalmæ*, antennæ, placed behind the eyes.

*Carinata*, elytra, forming a ridge at the suture.

*Cauda*, the tail, a part affixed to the extremity of the abdomen.

*Caudata*, larva, with a tail or horn; as in the *Sphinx*.

*Caudatæ*, alæ, in which one or more projections in the hinder wings are extended into processes.

*Chela*, the extreme part of the foot, with a moveable lateral toe, like the claw of a crab.

*Chelyferi*, pedes, thick at the extremity with a moveable lateral claw or toe.

— palpi, antennæ, &c. ending in a chela.

*Chrysalis*, a sort of Pupa, that is often of a golden colour.

*Cicatrix*, an elevated and somewhat rigid spot.

*Ciliatæ*,

- Ciliatæ**, antennæ, fringed with parallel setæ, infered along the side of the antennæ thro' their whole length.
- Cingula**, coloured bands or belts surrounding the abdomen.
- Clavatæ**, antennæ, palpi &c. club-shaped, terminating in a knob; growing gradually thicker towards the apex.
- Clypeatum**, caput, covered above with a leaf-like spreading substance.
- Clypeus**, a horny horizontal part of the head, covering the mouth.
- Clypeatus** thorax, covered with a membrane unconnected at the margin, projecting beyond the disc.
- Coadunatæ**, antennæ, connected at the base.
- Coadunata** elytra, undivided, joined together at the suture.
- Coarctata**, Pupa, inclosed in a case thro' which no part of the insect can be discerned.
- Coecus**, ocellus, placed among others, and wanting the pupil.
- Coleoptera**, an order of insects including those which have crustaceous elytra or covers to their wings, with a straight longitudinal suture.
- Coleoptrati**, cimices, the elytra almost wholly coriaceous.
- Coleoptra**, both elytra.
- Colorati**, oculi, of a different colour from that of the head.
- Communis**, fascia, extended over both upper and under wings.
- Completa**, Pupa, having feet and using its limbs with agility.
- Compositi**, oculi, furnished with many and often numerous lenses, for the purpose of seeing near objects and those at a side.
- Compositus**, aculeus, having two or more sharp points or darts.
- Compressum**, corpus &c. flattened at the sides.
- Concolores**, alæ, of the same colour both on the upper and under surfaces.
- Concolores**, oculi, of the same colour with the head and body.
- Conicum**, caput, rostrum, &c. cylindrical, growing smaller at the apex.
- Connata**, elytra, united at the suture.
- Conniventes**, alæ, which when at rest have the anterior margin in part contiguous to the inner or posterior margin, whether erect or incumbent.
- Contigui**, oculi, touching one another.
- Convexus**, thorax, surface elevated like the section of a sphere.
- Convolutæ**, alæ, wrapping round the abdomen, the upper surface forming a convexity.

**Cordatus**

- Cordatus*, thorax, heart-shaped, the base notched, without angle.  
*Coriacea*, elytra, of a substance like leather.  
*Cornutum*, caput, some part ending in a horn.  
*Cornutus*, *Scarabæus*, having one or more horns either on the head or thorax.  
*Costa*, alæ, in *Papilio*, the margin between the base and the apex.  
*Crenatus*, thorax, crenatæ alæ, &c. the margin notched, but in such a way that the incisures are pointed to neither extremity.  
*Cristatus*, thorax, the carinated ridge arched, dentated and compressed.  
*Cruciatæ*, alæ, incumbent, but the inner margins lying over each other.  
*Cruciato-complicatæ*, alæ, folded together cross-wise.  
*Cruciatus*, thorax, peaked before and behind, as if with outstretched arms.  
*Cruentum* pectus, marked with blood-coloured spots.  
*Crustaceum*, integumentum, somewhat hard, elastic, resisting the impression of the finger.  
*Cucullatus*, thorax, the carinated ridge hollowed before into a kind of hood.  
*Cursorii*, pedes, formed for running.  
*Cutaceum*, integumentum, soft, yielding to the finger.  
*Cylindricum*, rostrum, &c. linear and round.

## D

- Danaï*, a division of the genus *Papilio*, containing those with very intire wings, which are either white or variegated.  
*Declaratum* insectum, the insect arrived at its perfect state.  
*Deflexæ*, alæ, incumbent, but not horizontally, the outer edges declining towards the sides.  
*Deltoidea*, macula, nearly triangular.  
*Dentatæ*, antennæ, set with remote spreading points in one direction.  
 ——— maxillæ, elytra, the margins set with sharp pointed processes.  
*Dentata*, femora, the margin having one or more indentations.  
*Dentato-erosæ*, alæ, hollowed, with dents between the hollows.  
*Denticulatæ*, alæ, with minute distinct dents.  
*Denudatæ*, alæ, a certain part destitute of scales but opake.  
*Depressum*, caput &c. pressed downwards as it were, that is thinner than it is broad.  
*Didymus*, ocellus, with two contiguous ocelli.

Digitatæ



**Digitatæ**, alæ, divided nearly to the base like fingers.

**Dimidiata**, elytra, covering but half of the back.

**Dioptratus**, ocellus, with a transparent pupil divided transversely by a small line.

**Diptera**, an order of insects, including those which have only two wings and two halteres or poisers.

**Discus elytræ**, alæ, the middle between the base, the apex, the margin and the suture.

—— thoracis, the middle of the thorax.

**Distinctæ**, antennæ, not united at the base.

**Divaricatæ**, alæ, incumbent, but diverging behind.

E.

**Elinguis**, Phalena, the tongue so small as to be hardly visible.

**Elongatæ**, alæ primores, the posterior margin longer than the interior.

—— antennæ, longer than the head.

—— palpi, longer than common, or longer than the mouth.

**Elytra**, two crustaceous or coriaceous wings, expanded in flight; when at rest covering the abdomen, and inclosing the membranaceous wings.

**Emarginatum**, caput, thorax, &c. terminating in a notch.

**Epigastrium**, a scale in the hinder part of the breast, between the second pair of feet and the last; as in the genus *Mordella*.

**Equites**, those *Papilio*s whose upper wings are longer from the posterior angle to the apex, than from the same angle to their base.

**Erectæ**, alæ, when at rest, standing up so as to approach each other.

**Erosæ**, alæ, with minute obtuse hollows, and unequal lacinix.

**Eruca**, the old word for Larva.

**Exarticulatæ**, antennæ, with no distinct articulations.

**Excaudatæ**, alæ, having no projecting processes.

**Exscutellatus**, *Scarabæus*, having no scutellum.

**Exsertæ**, maxillæ, obvious, and divided from the head.

**Exsertum**, caput, distinctly separated from the thorax.

**Exsertus**, aculeus, projecting, not lying hid in the body.

**Extensæ**, alæ, not lying upon one another.

F.

**Falcatæ**, alæ, the posterior margin obtusely hollowed.

**Falcatum**, abdomen, shaped like a sickle.

**Fascia**, a broad transverse line.

—— dimidiata, running only half the length of the wing.

- Fasciati, oculi, marked with stripes of a different colour.  
 Fasciculus, a tuft on the back of a Caterpillar.  
 Fastigiata, elytra, transverse at the apex, emarginated.  
 Femora, the thighs, that part of the limbs nearest the trunk.  
 Fenestra, a clear transparent spot.  
 Fenestratae, alae, with one or more transparent spots.  
 Fenestratus, ocellus, the pupil glassy and transparent.  
 Filatae, antennae, proper to some species of *Musca*, and *Tabanus*, simple, without a lateral hair or thread.  
 Filiformes, antennae, of the same thickness through their whole length.  
 Fissae, alae, digitated, divided into linear portions with straight margins.  
 Fissiles, antennae capitatae, the knob split longitudinally into several parallel parts or laminae.  
 Flexilia, elytra, capable of being bent, not crustaceous.  
 Flexuosa, macula, irregularly waving.  
 Foliacea, cauda, spread out like a membrane.  
 ——— Cicada, the thorax compressed, membranaceous.  
 Folliculata, pupa, inclosed in a case, made of hair or silk, or of leaves, wool, earth, &c. conglutinated together.  
 Forcipatae, maxillae, like a pair of pincers.  
 Furcatae maxillae, forked, divided into two parts at the ends.  
 Fusiformes, antennae, growing gradually thicker towards the middle.

## G.

- Galea, a term of Fabricius, a cylindrical, obtuse, almost bladder-like body, covering the back of the maxillae.  
 Geometrae, a division of the Genus *Phalaena*, with wings spreading horizontally when at rest.  
 Gemmati, a subdivision of the section *Nymphales*, in the genus *Papilio*, containing such as have ocelli in their wings.  
 Geniculatum, rostrum, bent, and making an angle at the flexure.  
 Gibbum, caput, convex both above and below.  
 Gibbus, thorax, the disc elevated but not spherical.  
 Glabrum, corpus, &c. of a smooth slippery surface.  
 Globosae, antennae capitatae, the knob spherical.  
 Gregaria, larva, that live in society, many of them inclosed in a web.  
 Guttata, *Coccinella*, the elytra red or yellow, with white dots or spots.

*Haemisphaerium*,

H.

**Haemisphericum**, corpus, convex above, flat below, like the section of a globe.

**Halteres**, poisers, in the order of *Diptera*, two globular bodies placed on slender stalks, behind the wings, and seated on the thorax; sometimes they are an arched membranaceous scale.

They are said to be the rudiments of the posterior wings, and serve to keep the insect in equilibrium during flight.

**Hastata**, pupilla &c. javelin-shaped, that is, triangular, the base, and sides hollowed, the posterior angles spreading horizontally.

**Haustellum**, a sort of trunk at the mouth of the insect, consisting of setæ, which are either inclosed in a bivalve sheath or without one.

**Heliconii**, a division of the genus *Papilio*, including those with narrow, oblong, intire primary wings, sometimes appearing deprived of scales; the posterior wings very short.

**Hemelytra**, wings either wholly or in part formed of a substance intermediate between leather and membrane.

**Hemiptera**, an order of Insects, including those which have their upper wings half crustaceous, not divided by a straight longitudinal suture, but incumbent on each other.

**Hexapoda**, insecta, having six feet, as is the case with the greater part of perfect insects.

**Hirta**, elytra, thickly covered with short hairs.

**Hispida**, elytra, antennae, &c. set with short rigid bristles.

**Horizontales**, alae, which when at rest are parallel to the horizon.

**Hyalinae**, alae, fasciae, &c. quite transparent.

**Hymenoptera**, an Order of Insects, including those which have four membranous wings; tail furnished with a sting.

**Hyperophthalmas**, antennae, placed above the eyes.

**Hypophthalmas**, antennae, placed under the eyes.

I.

**Imago**, the perfect insect, after having gone thro' the states of Larva and Pupa.

**Imbricatus**, set with scales, lying over one another like the tiles of a house.

**Immarginatus**, thorax, without clypeus or distinct rim.

**Immobiles**, oculi, so fixed in the head as to be incapable of motion.

**Immobilia**, elytra, that cannot be moved and consequently are useless for flight.

**Inaequalis**

- Inaequalis, thorax, the surface not flat, but with irregular elevations and depressions.  
 Incompleta, pupa, having feet and wings, but motionless.  
 Incrassata, femora, growing thicker in the middle.  
 Incruentum pectus, not marked with blood-coloured spots.  
 Incumbentes, alae, which when at rest cover the back of the abdomen horizontally.  
 Incurvi, incurvati, palpi, &c. turning straight upwards at the ends, as if lying over the mouth.  
 Incurvatae, alae, the anterior margin bent like an arch.  
 Inferi, oculi, os, placed on the under side of the head.  
 Inflexum, caput, not on the same plane with the thorax, bending inward.  
 Inflexum, rostrum, not projecting, but bent and going towards the belly by the breast.  
 Inflexa, proboscis, tending towards the breast.  
 Instita, a stria, of equal breadth throughout.  
 Integrae, alae, undivided, without indentations.  
 Integra, elytra, completely covering the back.  
 Integrum, caput, thorax, &c. undivided, without any furrow.  
 Integerrimus, thorax, alae, &c. with a margin linear and not in any wise cut.  
 Interrupta, fascia, striga, &c. broken, but continued either above or below.  
 Irroratae, alae, marked with exceedingly minute points.

## L.

- Labia, prominent parts, including the mouth.  
 Lamellatae, antennae, pectinated but with scales instead of bristles.  
 Lanceolatae, antennae, alae, &c. oblong, attenuated at both extremities.  
 Larva, or Eruca, caterpillar, grub, maggot, the animal as it comes from the egg, slow, sterile, and voracious.  
 Laterales, oculi, placed at each side of the head.  
 Lateralia, labia, on the side of the mouth and perpendicular to it.  
 Lepidoptera, an Order of Insects, including those which have four wings covered with fine farinaceous scales.  
 Linea, a longitudinal line of equal breadth, and of a different colour from the rest of the wing.  
 Lineare, corpus, &c. oblong, equal in breadth throughout.  
 Lineata, elytra, marked with depressed lines.  
 Lineatus, thorax, marked longitudinally with coloured lines.  
 Lineato-punctata, elytra, dotted, the dots or punctures disposed in lines.

**Lingua**, the tongue, a membranaceous or fleshy organ, lying hid among the reflexed palpi, and convoluted or rolled up.  
**Litura**, a spot of a deeper colour in one part than another.  
**Lobatus**, thorax, divided into distinct parts.  
**Longae**, antennae, longer than the body.  
**Longum**, rostrum, longer than the head.  
**Longius**, rostrum, longer than the head and thorax.  
**Longissimum**, rostrum, longer than the body.  
**Longirostris**, Curculio, with a rostrum longer than the head.  
**Lunati**, oculi, resembling a crescent or new moon.  
**Lunatum**, caput, roundish, divided at the base by a hollow, the hinder angles acute.  
**Lunula**, a spot shaped like a new moon.  
**Lunulatae**, maxillae, thick in the middle, and smaller towards the base and the apex.

M.

**Macroura**, with a tail longer than the body.  
**Macula**, a spot, larger than punctum, of an indeterminate figure, and of a different colour from the ground.  
**Maculatae**, alae, marked with spots.  
**Mandibulae**, according to Fabricius, two transverse horny bodies, including the sides of the mouth above. They are situated immediately under the clypeus, and are in general larger than the maxillae.  
**Manus**, a foot shaped like the claw of a crab.  
**Marginatus**, thorax, elytra, &c. with a free elevated margin.  
**Margo**, thoracis, the part surrounding the disc.  
—— elytrae, the outer rim next the belly, from the base to the apex.  
—— exterior, anticus, crassior alae, the margin between the base and the apex.  
—— posterior, the margin between the apex and the angulus posticus.  
—— interior, or tenuior, the margin between the base and the angulus posticus.  
**Maxillae**, organs at the mouth, generally semicircular, pointed at the ends, moving transversely, that is, horizontally, not perpendicularly as in the human species, for the purpose of holding and comminuting the food; always two in number. According to Fabricius, they are two, generally membranaceous bodies, including the sides of the mouth below: they are always situated below the mandibles.  
**Maxillosum**, os, with large maxillae.

Mediocrates,

- Mediocris, antennae, of the same length with the body.  
 Membranacei, Cimices, the body flat and thin like a leaf.  
 Membranaceum, corpus, nearly of the consilience of a leaf.  
 Membranaceo-crustacea, elytra, partly crustaceous, viz. the base and margin; partly membranaceous, viz. the apex, the disc, and suture.  
 Mobiles, oculi, so situated as to be moveable.  
 Moniliformes, antennae, filiform, with distinct sub-globular or bead-like articuli.  
 Mucronatae, antennae, &c. terminating in a sharp projecting point.  
 Multivalve, rostrum, forming a tube by means of many valves uniting.  
 Muricata, elytra, rough with rigid spines.  
 Mutica, femora, without dent or spine.  
 Mutici, pedes, without claws or spines.  
 Muticum, caput, thorax, &c. not furnished with horns, spines, or tubercles.  
 Muticus, Scarabæus, having no horns.  
 Mutilata, elytra, which do not completely cover the back, whether with respect to length or breadth.

## N.

- Natatorii, pedes, compressed, doubly ciliated and two edged, formed for swimming.  
 Nebulosæ, alae, marked with many scattered, abrupt lines, of various breadth.  
 Nervosae, alae, with nerves large for the size of the wing.  
 Neuroptera, an Order of Insects, including those with four wings which are membranaceous, transparent and naked; they have no sting.  
 Nictitans, ocellus, half shut up by a lunulated spot, and by another ring and another lunulated pupil.  
 Nitidum, corpus, the surface smooth and shining.  
 Nitidissimæ, alae, with scales exceedingly smooth and resplendent.  
 Nobiles, Phalaenae. Such Phalaenae are so called as are distinguished by beautiful colours, red or yellow, as the P. Lectrix, Hebe, Hera, Caja, Virgo, Plantaginis, Dominula, Matronula, Aulica, Ancilla, &c.  
 Noctuae, a division of the genus Phalaena, comprehending those which have incumbent wings, with setaceous, not pectinated antennae.  
 Nuda, larva, naked, not hairy.  
 Nuda, pupa, not inclosed in a case, not folliculated.

Nudæ,

**Nudae**, antennae, not garnished with hairs or bristles.

**Nudi**, halteres, without a scale.

**Nudum**, corpus, not covered either with wool, hair, or bristles.

**Nutans**, caput, fixed transversely at right angles with the thorax.

—— rostrum, transversely fixed to the head.

**Nutantes**, antennae, at the points bent downwards.

**Nympha**, the same with Pupa.

**Nymphales**, a division of the genus Papilio, containing those with dentated wings.

O.

**Obconicum**, labium, inversely conical.

**Obcordatum**, thorax, heart-shaped, with the apex towards the abdomen.

**Obliteratus**, ocellus, the pupil scarcely distinguishable.

**Oblongum**, the transverse diameter a good deal less than the longitudinal.

**Obovatum**, thorax, &c. inversely ovate, the narrow end downwards.

**Obsoleta**, stria, indistinct, as if obliterated.

**Obtecta**, Pupa, wrapped up in a crustaceous covering, the thorax and abdomen obvious.

**Obtusum**, corpus, thorax, blunt, rounded at the apex.

**Ocellus**, an eye, with a round spot of a different colour in the middle, which is called the Pupil.

**Ocelli**, the same with Stemmata.

**Ocellatae**, alae, with one or more ocelli.

**Octopoda**, insecta, having eight feet, as the Acari, Phalangia, Scorpiones, Araneae and Cancr.

**Octoni**, oculi, eight distinct eyes, as in Spiders.

**Orbiculatum**, corpus, the transverse diameter equal to the longitudinal.

**Ovale**, corpus, thorax, &c. egg-shaped, the out-line at both extremities equal.

**Ovatum**, corpus, thorax, the longitudinal diameter exceeding the transverse, and the latter broader at the base than at the apex.

P.

**Paganae**, Phalaenae, are dull coloured and cinereous, as well Bombyces as Noctuae, in general crested, with an oval and a kidney shaped stigma on the upper wings, and below

the under wings, a brown dot and arch; they are with difficulty distinguished.

Pagina, superior, the upper surface of the wings.

—— inferior, the under surface.

Palatum, the interior part of the transverse lip.

Palpi, organs placed at the mouth, often articulated, and generally shorter than the antennae, sometimes two only, frequently four, seldom six.

Patellae, orbicular, elevated, moveable bodies, on which the base of the femora rests, as in the Ichneumons.

Patentes, alae, horizontal, extended when at rest, not uniting or incumbent.

Patulae, alae, nearly horizontal, little inclined, and not incumbent.

Pectinatae, antennae, sending out from both sides parallel bristles, the whole length.

Pectines, in the genus *Scorpio*, two bodies situated between the abdomen and the breast, dentated on one side, but the number of the dents varies.—Plate VII. fig. 24.

Pectinicornis, the antennae pectinated.

Pectus, the under part of the thorax to which the feet are attached.

Pedatae, antennae, bent into angles, like a foot.

Pectorale, os situated in the breast, in a tube or rostrum.

Pedes, the limbs, in most insects are attached to the thorax, in some to the thorax and abdomen. The term is by Linnaeus applied to the whole limb, including the femur, tibia, tarsus and unguis.

Pediformes, palpi, with a geniculated articulation like a foot.

Pedunculati, oculi, elevated on a stalk or peduncle.

Perfoliatae, antennae capitatae, pierced, the knob horizontally split, the pieces connected in the middle.

Perfoliato-imbricatae, antennae, consisting of small concave pieces, imbricated and connected in the middle.

Petiolatum, abdomen, attached to the thorax by means of a slender elongated tube.

Phalerati, a sub-division of the section *Nymphales* in the genus *Papilio*, containing such as have no ocelli in their wings.

Pilosum, corpus, set with distinct long hairs.

Planum, abdomen, the under part flat.

Planae, alae, extended, horizontal, which cannot be folded up.

Plani



**Plani, oculi, thorax, &c.** the surface on the same plane with the head.

**Plantae**, the under part of the tarsi.

**Plantae, haemisphaericae**, orbicular, convex above, excavated below, as in the male *Dytisci*.

**Plebei**, a division of the genus *Papilio*, containing the smaller species.

**Plicatiles, plicatae**, alae, wings which, when at rest, are folded up, but expanded in flight.

**Plicatilis, proboscis**, pliable, so as that the point can be folded up.

**Plumatae**, a section in the division of the genus *Musca*, containing those species which have the antennae aristatae, but the bristle feathered.

**Plumosae**, antennae, like a plume of feathers.

**Polyphaga**, larva, that will eat a variety of plants.

**Polypoda**, insecta, having many feet, as the *Scolopendrae*, *Juli*, &c.

**Porcata, clytra, &c.** with elevated longitudinal lines or ridges.

**Porrecti, palpi, &c.** stretched straight forward.

**Porrectum, caput, rostrum, &c.** prominent and elongated.

**Praemorsa, clytra**, the apex terminating obtusely, with unequal incisures.

**Prismaticae, antennae**, linear, with more than two flat sides.

**Proboscis**, a hollow tube at the mouth, often fleshy, enlarging at the point.

**Prolongatum tubo, caput**, the apex running out into a tube.

**\_\_\_\_\_ vesica, caput**, the apex, running out into a bladder.

**Prominens, caput**, on the same plane with the thorax, but narrower.

**Prominentes, maxillae**, placed straight before the head, and on the same plane.

**Prominuli oculi**, standing far out from the head.

**Pro-opthalmae antennae**, placed before the eyes.

**Pubescens, corpus**, covered with soft hair.

**Puculatae, alae**, with membranes promiscuously concave and depressed.

**Punctatae, alae**, marked with very small dots.

**Punctata, Coccinella**, the elytra red or yellow, with black points or spots.

Punctata, elytra, sprinkled with hollow dots or punctures.

Punctum, a small dot, of a different colour from the rest of the wing.

—— callosum, an elevated, and somewhat rigid point.

—— ramosum, divided into distant parts.

—— ocellare, an orbicular spot of a different colour in the middle.

—— sesquialterum, formed of two spots that are distinct, but contiguous.

—— geminum, two spots near each other, but separated.

Pupa, Nympha, Aurelia, Chrysalis, the animal changed from the state of Larva, often motionless, and destitute of a mouth.

Pupilla, the different coloured spot in the centre of the ocellus.

Pustulata, Coccinella, the elytrae black with red spots.

Pyralides, a division of the genus Phalaena, containing those whose wings are connivent, and in shape resemble a triangle.

## Q.

Quaterni oculi, four eyes, all on the crown of the head, two before and two behind the antennae; or two on the crown of the head, and two below; or two on the crown of the head, and one on each side.

## R.

Radiatae, alae, with nerves diverging like rays from a common centre.

Ramosae antennae, with many lateral branches.

Reconditus, aculeus, always concealed within the abdomen, and seldom thrust out.

Recti, palpi, straight, without flexure.

Rectum, rostrum, not bent.

Recurvata, proboscis, turning backward.

Recurvati, palpi, turned back.

Remoti oculi, remotae antennae, distant from each other.

Reniformis, kidney-shaped, nearly round, hollowed on one side.

Repandae, alae, with a waving, but plain margin.

Replicatilis, lingua, the point capable of being turned back.

Reticulatae, alae, with nerves disposed like net-work.

**Retraçile,**

**Retractile**, caput, capable of being drawn at pleasure within the thorax, and concealed there.

**Retractilis**, aculeus, for the most part exerted, but capable of being drawn in.

**Retractum**, caput, placed within the thorax, and not to be distinguished from it, as in Cancer, Scorpio, &c.

**Retusum**, corpus, thorax, &c. terminating in an obtuse hollow.

**Reversee**, alae, deflexed, and the margin of the secondary wings projecting from under the primary.

**Rigidae**, antennae, elytra, &c. not flexible.

**Rivulus**, a stripe, running irregularly over the wing, and of a different colour from it.

**Rostrata**, cauda, standing out like a beak.

**Rostrum**, the mouth lengthened out into a snout or tapering beak.

**Rotundatae**, alae, the posterior margin devoid of angles.

**Rotundatum**, corpus, thorax, the outline nearly circular, without corners.

**Rugosum**, corpus, caput, &c. wrinkled, marked with waved and elevated lines, either longitudinally or transversely.

**Rurales**, a sub-division of the section Plebeii in the genus *Papilio*, containing such whose wings have obscure spots, that is, not transparent.

**Rusticae**, Phalaenae, see *Paganæ*.

S.

**Sagittata**, macula, triangular, the posterior angles acute, deeply indented at the base.

**Saltatorii**, pedes, with gross femora, formed for leaping.

**Scabrum**, corpus, elytra, &c. rough with hard raised points.

**Scutellum**, the hinder part of the thorax, often triangular, the side next the thorax, divided from it by a suture.

**Scutellati**, Cimices, having a Scutellum as long as the abdomen, and covering it and the wings.

**Scutellatus**, Scarabaeus, having a scutellum.

**Securiformes**, antennae, shaped somewhat like an axe.

**Semicompleta**, Pupa, having feet, but only the rudiments of wings.

**Seni**, oculi, six distinct eyes, as in some spiders.

**Sericeum**, corpus, &c. covered with soft shining hairs.

**Serratae**, antennae, toothed like a saw, the incisures turned towards the extremities.

*Serratus*,

Serratus, thorax, the margin toothed like a saw, the incisures turned towards the head.

Sesquialter, ocellus, or Sesquicellus, a large ocellus inclosing a smaller one.

Sesquitertia, fasciæ, occupying the fourth part of the wing.

Sessile, abdomen, sitting, attached to the thorax in its whole breadth; not distant and connected by a filament.

Seta, a bristle.

Setaceum, rostrum, slender, flexible and gradually tapering towards the apex.

Setacei, palpi, antennae, &c. growing gradually more attenuated from the base to the point.

Setariae, a section in the division of the genus *Musca*, containing those species which have the antennae aristatae, the bristle being simple and naked, in opposition to *Plumatae*.

Seticornis, the antennae in the shape of a bristle.

Setosa, cauda, elongated, slender, gradually attenuated.

Simplex, aculeus, having one dart or point.

Simplices, antennae, not branched.

—— oculi, furnished only with one lens.

—— palpi, not articulated.

Simplicia, femora, equal, and without any remarkable difference in thickness.

Sinus, a hollow, as if scooped out. Sinuata fasciæ.

Spinosae, antennae, pedes, &c. set with large subulated spines.

Spinosa elytra, the margins set with subulated rigid spines.

Spiracula, the respiratory organs, situated on the sides of the abdomen.

Spiralis, lingua, rolled up like the spring of a watch between two palpi.

Spiriformes, antennae, rolled into a spiral form.

Spirilinguis, Phalaena, the tongue rolled up into a spiral.

Squamula, an erect membrane, placed between the thorax and abdomen; as in the *Formica*.

Squarrosus, thorax, divided into elevated laciniae, not level.

Stemmata, shining eyes generally placed together on the crown of the head, for the purpose of seeing objects at a distance, and above the insect.

Sternum, the carinated breast-bone.

Stigma, the spot or anastomosis in the upper wings, at the branching of the nerves near the anterior margin.

Stigmata, the apertures on the sides of insects, by which they breathe.

Stria

- Stria**, a longitudinal line, from the base of the wing to the apex, expanding in breadth.
- Striatus**, thorax, &c. slightly channelled with parallel lines.
- Striga**, a narrow transverse line.
- Stupoli**, palpi, covered with soft hair or down.
- Stylata**, cauda, terminated by one or more setae.
- Suberosae**, alae, somewhat indented, but irregularly.
- Subcaudatae**, alae, the process in the posterior wings, hardly longer than a ferrature.
- Subcutaneae**, larvae, small caterpillars that feed within the substance of a leaf.
- Submarginatus**, thorax, the margin having a distinct rim, but neither free nor elevated.
- Subpetiolatum**, abdomen, attached to the thorax by a short tube, nearly equalling the thorax in breadth.
- Subrotundus**, thorax, the outline nearly circular.
- Subulati**, palpi, antennae, &c. linear at the base, growing more slender, and pointed at the apex.
- Sulcatum**, corpus, thorax, &c. with one or more deep hollow furrows.
- Sulcus**, a deep furrow.
- Sutura elytrae**, the part where the elytra meet and form a line in the middle of the back from the base to the apex.

## T.

- Tarsi**, those parts of the limbs that are between the tibiae and unguis, generally articulated with 3, 4, or 5 joints.
- Teres**, corpus, &c. cylindrical.
- Tergum**, the upper part, or back of the abdomen.
- Teretiusculus**, thorax, nearly cylindrical.
- Terminale**, os, in the apex of the head.
- Terminalis**, fascia, near the apex and posterior margin.
- Tessellata**, macula, marked with another colour, chequer-wise.
- Tessellatae**, alae, with black spots so disposed as to resemble a chequered pavement.
- Tetragonus**, thorax, with four corners.
- Tetrapoda**, insecta, some Butterflies, that have six feet, but the first pair small, weak, and unfit for walking.
- Thorax**, the back of the trunk.
- Tibiae**, the legs, that part of the limbs between the femora and tarsi.
- Tineae**, a division of the genus *Phalaena*, whose wings are convoluted or rolled up, so as to form a cylindrical figure.
- Tomentosum**, covered with a soft down or wool.

Tortrices,

- Tortrices**, a division of the genus *Phalaena*, with very obtuse wings, the exterior margin of which is curved.
- Transversa**, labia, placed upon the mouth transversely.
- Transversus**, thorax, linear, but transverse.
- Tripupillatus**, ocellus, having three pupils.
- Triquetra**, cauda, having three plane sides.
- Trifeta**, cauda, having three slender attenuated setae.
- Trochanteres**, oblong moveable bodies, affixed to the base of the femora, near the thorax, as in the *Carabi*.
- Troes**, those *Papilio*s of the section *Equites*, which have bloody spots on their breast. They are generally of a dark colour.
- Truncata**, elytra, abbreviated, the apex terminating in a transverse line.
- Truncatae**, antennae capitatae, the knob terminated abruptly by a transverse line.
- Truncus**, that part of the body between the head and the abdomen, in which the feet are inserted, consisting of the *Thorax*, *Scutellum*, *Pectus*, and *Sternum*.
- Tuberculatum**, caput, thorax, &c. rough with rigid prominent warts or tubercles.
- Tubulosum**, rostrum, perforated like a tube; intire.
- Tumidae**, alae, with elevated membranes among the veins.

## U.

- Vagina**, a bivalve sheath at the mouth of certain insects, sometimes articulated, and inclosing setae.
- Vaginatus**, aculeus, inclosed in a bivalve sheath.
- Valvulae**, proboscidis, little concave membranes, inclosing the proboscis.
- Variegatae**, alae, of different colours.
- Venae**, vessels diffused over the wing.
- Venter**, the under part of the abdomen.
- Verticales**, oculi, placed on the crown of the head.
- Verticillatae**, antennae, with hairs arranged in whirls at the joints.
- Villosus**, thorax, &c. covered with soft hairs.
- Vitta**, a stria with a waved or furrowed margin.
- undata, with waving obtuse sinuses.
- repanda, with waving acute sinuses.
- anastomosans, following the course of the nerves of the wing.
- interrupta, not extending in a continued line, but continued either above or below.

Uncinatae,

**Uncinatae**, antennae, clavated and mucronated, the point reflexed, so as nearly to form a right angle.

**Undulatae**, alae, marked with continuous, and nearly parallel waving lines.

**Ungues**, subulatae, hook-shaped spines at the apex of the tarsi.

**Unguiculatae**, alae, with a membranaceous tooth or claw at the costa, or exterior margin.

**Urbicoli**, a sub-division of the section *Plebeii*, in the genus *Papilio*, containing such as have for the most part transparent spots on their wings.

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*TERMS used in TESTACEOLOGY.*

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CONCHÆ.

A.

**ABBREVIATA**, stria, not extending to the margin.

**Aequales**, auriculæ, of the same size in both valves.

**Aquilatae**, valvulae, where the anterior and posterior sides are equal in size and figure.

**Aequivales**, where both valves are perfectly similar.

**Ambitus**, the circumference or outline of the valves.

**Analís**, dens, next the anus.

**Antiquata**, testa, longitudinally furrowed, but interrupted by transverse furrows, as if the shell had acquired new growth at each furrow.

**Anus**, a depression on the posterior side near the hinge.

**Ani**, regio, the posterior area or region.

**Anticus**, dens, next the rima.

**Aurita**, testa, the valves at the hinge produced into a thin prominent angular process, as in the *Ostreæ pectinatae*.

**Auriformes**, nates, when there is an incurvated fornix within.

**Auriculæ**, the thin angular processes at the base of the valves in the *Pectines*.

B.

**Barbatâ**, testa, covered on the surface with rigid hairs.

**Basis**, the region next the hinge.

**Bifariae**,

**Risariae**, striae, diverging, some running to the fore, others to the hinder part of the shell.

## C.

**Callus**, is composed of two short ribs, united at the base, and converging at the apex towards the hinder part of the shell.

**Canaliculatae**, squamulae, longitudinally channelled.

**Canaliculatus**, margo, surrounded at the region of the anus by a somewhat longitudinal groove.

**Cardinalis**, margo, behind the hinge.

**Cardo**, the hinge, that part of the circumference at which the valves cohere; it forms the thickest part of the shell, and, in some, is furnished within with eminences called teeth.

**Cavitas**, the inner surface of the shell.

**Ciliata**, testis, fringed.

**Clausa**, rima, covered by the nymphae.

**Complicatus**, dens, membranaceous, bent to an acute angle, as in the *Mastræ*.

**Compressa**, testis, one valve more flat than the other; the place near the hinge not so gibbous.

**Concavae**, costae, empty within.

**Corniformes**, nates, lengthened out, straight, and pointed.

**Costa**, cardinis, an elevated line like a rib, running from the hinge on the inside towards the upper margin.

**Costae**, rays much elevated, almost triangular, distinct and parallel.

## D.

**Decussatum-striata**, testis, net-like, striated both longitudinally and transversely.

**Dens**, a tooth, an acute eminence, at the hinge within, serving the purpose of joining and strengthening the valves, and inclosing the animal.

**Depressus**, cardo, with a flat tooth extending the hinge towards the anterior margin.

**Dextra**, valvula, if the bivalve is placed upon the hinge with the vulva from, and the anus towards the person, and then the valves folded back, the right valve will fall to the right hand, and the left to the left hand. The right or upper valve, and the left or under, may also be known by the mark of the attachment of the nervous ligament, which is always on the right hand side of the upper valve, and on the left hand side of the under.

**Discus**, the middle part of the valves, or that which lies between the umbo and the limbus.

Dissep-



**Dissectæ**, auriculæ, separated from the margin of the shell by a sinus.

**Diffipimentum fornicis**, where the inferior margin is extended towards the interior of the shell.

**Distincta**, vulva, separated from the sides of the shell by a sulcus or carina.

**Dorsata**, testa, the back obtusely carinated, as in the *Chiton aculeatum*.

**Duplicatus**, dens, deeply divided, as if bifid.

## E.

**Echinati**, radii, set with spines.

**Edentula**, testa, the margin intire, without teeth.

**Erectus**, dens, rising perpendicularly when the valve is laid upon its back.

**Excisæ**, auriculæ, separated from the margin of the shell by a sinus.

**Excisus**, cardo, with a wide transverse chink.

**Exoleta**, testa, as if worn or faded.

## F.

**Fornicatus**, umbo, the region round the hinge, in the inside, much excavated.

**Fornix**, the excavated part under the umbo. It likewise signifies the upper or convex shell in the *Ostreæ*.

**Fastigiata**, testa, ending above as it were transversely.

**Fornicatae**, squamulae, convex above, concave below.

**Fornicati**, sulci, set with arched scales.

**Fossula**, **Foveola**, **Sinus**, **Scrobiculus**, are used in the same sense, signifying an impression or cavity; there may, however, be some distinction; for instance, when the teeth of the cavity are not immersed in the cartilage which connects the valves, such a cavity is called *Scrobiculus*; but if filled with teeth, *Foveola*.

## H.

**Hians**, testa, the valves in one place not joining, but gaping, so that the valves at that place stand wide, as in the *Pholades*.

**Hiantes**, nymphæ, distant from each other.

**Hymen**, the ligament, a membrane close by the hinge which connects the valves—this is often wanting in collections; it always closes the rima, and is situated between the labia and nymphæ.

## I.

*Imbricatæ*, *squamulæ*, lying over one another like tiles on the roof of a house.

*Inaequilateræ*, *valvulae*, when the anterior and posterior sides make different angles with the hinge.

*Inaequilineatae*, *striae*, not parallel.

*Inaequivalves*, where one valve is more convex than the other, as in the *Pectens*.

*Incurvatae*, *nates*, bending towards each other.

*Incumbentia*, *labia*, one lying over the other.

*Inflexa*, *testa*, the anterior side as if broken and bent downwards, as in the *Tellinae*.

*Inflexae*, *nates*, bent towards each other.

*Inflexa*, *vulva*, when the *labia* are turned inwards.

*Intestinum*, a membranaceous tube, by which some of the *Lepadæ* and *Anomiae* adhere to other bodies.

*Intractae*, *nymphæ*, not prominent.

*Intrusus*, *dens*, received into a pit or hollow of the opposite valve.

## L.

*Labia*, the margins round the hymen.

*Lacunosae*, *valvulae*, with a longitudinal depression.

*Latitudo*, *testae*, from the posterior to the anterior margin.

*Lateralis*, *cardo*, extending to one side.

*Lentiformis*, *testa*, shaped like the leaf of the water lentil, or duck-weed.

*Limbus*, the circumference of the valves within or behind the margin.

*Linguaeformis*, *testa*, linear, with rounded and very obtuse extremities.

*Litterata*, *testa*, *vulva*, &c. marked with characters resembling letters.

*Longitudo*, *testae*, from the hinge to the upper margin.

*Longitudinalis*, *cardo*, running almost the whole length of the shell, as in the *Arca*.

—————, *dens*, elongated in the direction of the margin.

## M.

*Marginatus*, *anus*, surrounded with an elevated margin.

*Margo*, the mouth of the shell.

———— inferior, supposing the hinge the base of the shell, it will be the inferior margin or side.

———— superior, that opposite to the hinge.

———— anterior, the margin on the side of the vulva.

*Margo*

**Margo posterior**, the side next the anus.

**Masticans, dens**, where the hinge is furnished with many close set teeth ; which correspond to one another when the valves are shut.

#### N.

**Nates**, (umbones), the base of the shell, about the hinge, often peaked.

**Navicularis, testa**, resembling the figure of a boat.

**Nymphae**, the cartilage to which the hymen is attached ; they are concealed by the hymen.

#### O.

**Operculum**; the under or flatter valve in the genus *Ostrea*.

It likewise sometimes signifies the smaller shells which shut the aperture in the genus *Lepas*.

#### P.

**Patulus, anus**, the margins forming a gap.

**Pectinata, testa**, longitudinally sulcated, or striated ; but the striae or furrows running at the hinge into an acute angle.

**Primarius, dens**, placed between the Nates.

**Prominentes, valvulae**, where one valve at a particular place is lengthened out beyond the other.

**Pubes, asperities** about the vulva, often extended to the nates.

#### R.

**Radii, rays**, elevated striae, running from the centre to the circumference.

**Radiata, testa**, with rays diverging from the hinge towards the circumference longitudinally.

**Ramosa, pubes**, marked with branching striae.

**Recurvatae, nates**, turned towards the anus.

——— striae, elevated, membranaceous, their margin turned towards the hinge.

**Reflexae, nates**, the same with *recurvatae*.

**Reflexus, cardo**, the outer margin reflected, as in the *Pholades*.

**Retractae, nymphae**, not prominent.

**Reversae, spinae**, turning upwards.

**Rima**, the interstice between the valves when the hymen is removed.

**Rostrata, testa**, the anterior extremity elongated and narrow.

#### S.

**Saccata, testa**, gibbous towards the inferior part.

**Scrobiculus**,

Scrobiculus, a depression or cavity. See Fossula.  
 Serratus, anus, the chink or anal suture serrated.  
 Sinistra, valvula; see Dextra.  
 Sinus, a groove or cavity.  
 Spirales, nates, twisted like a spire or wreath.  
 Squamulae, scales like those of fishes.  
 Striae, streaks, either raised or sunk.  
 Subulatus, dens, slender and tapering like an awl.  
 Succenturiatae, valvulae, those smaller irregular pieces which are annexed to the hinge of the Pholades.  
 Sulci, furrows; sometimes signify the same as Costae.  
 Sutura, or Rima, the interfice between the valves when the hymen is removed.

## T.

Terminalis, cardo, situated at the extremity of the shell.  
 Transversa basis, the margin at the hinge terminated by a straight line.  
 Truncata, testa, a part of the circumference very obtuse, as if cut off.  
 Truncatae, nymphae, shorter than the rima.  
 Truncatus, cardo, the base of the shell transverse, as if cut off, and the hinge placed within.  
 Tubulosae, squamulae, at the sides assuming the form of a tube.

## U.

Umbo, the peaked part of the shell, nearest the hinge.  
 Unguiculatus, margo, marked with arched scales.

## V.

Vacuus, dens, standing free, without entering into any hollow or chink of the opposite valve.  
 Valvulae, the pieces of which the Bivalve or Conch is composed.  
 Vesiculares, radii, set with hollow knobs.  
 Vulva, the region round the labia.

## COCHLEAE.

Abrupta, columella, the cauda as if transversely cut off at the base, so that it does not run out into a continued lip.  
 Abbreviata, cauda, shorter than the lowest wreath.

Acuminata,

*Acuminata spira*, tapering to a point.

*Ancipites, anfractus*, the wreaths longitudinally carinated.

*Anfractus*, the circumvolutions of the wreaths round the columella.

*Antica, testa*, that part of the shell which looks to the spire.

*Anticum, labrum*, the anterior part of the interior margin of the aperture which verges towards the spire.

*Apex*, the beginning or summit of the spire.

*Articuli*, the wreaths of some Nautili, between the genicula.

*Apertura*, the orifice of the whole shell.

#### B.

*Basis*, that part of the belly or body of the shell which is next the opening; likewise in the *Conus* and *Voluta*, the under part of the lips.

*Bifidi, anfractus*, marked with a line or transverse fulcus, like a future.

*Bilabiata, apertura*, furnished both with an inner and an outer lip.

*Bimarginata, apertura*, furnished with a double margin as far as the lip.

#### C.

*Canaliculati, anfractus*, having an excavation at the upper surface.

*Canalis*, the channel in the produced cauda, the margins of which turn in.

*Cancellati, anfractus*, surrounded with arched longitudinal ribs.

*Capitata, spira*, terminating in a thick head.

*Carinati, anfractus*, depressed into an angle which surrounds the whole wreath.

*Cariosa, spira*, as if worm-eaten.

*Cauda*, the elongated base of the Venter, Labia, and Columella.

*Caudata, columella*, elongated so as to project beyond the vertex.

*Centralis, siphon*, penetrating the centre of the partitions.

*Cingula*, sometimes mean zones, sometimes costae, sometimes a chain of knobs, sometimes cancelli, and sometimes they are used for membranaceous striae, which follow the course of the wreaths.

*Coarctata, apertura*, the opposite of *effusa*, where the margin surrounds the aperture without any gap.

*Concatenatae, spinae*, uniting at the base.

*Coarctatum, labrum*, drawn back to the base of the shell.

*Concatenata, puncta*, close together like a chaplet of beads.

*Clavata,*

- Clavata, testa, thick at the top, elongated towards the base.  
 Clausa cauda, the hollow channel nearly closed up, as in the *Murices caudigeri*.  
 Cochleae, shells of one piece; Univalves.  
 Concamerationes, the apartments in the Nautili.  
 Columella, the middle column round which the wreaths turn spirally. It is seen by a longitudinal section of the shell.  
 Conchae, shells consisting of two or more pieces or valves; Bivalves, Multivalves.  
 Contigui, anfractus, close, the opposite of disjuncti.  
 Continuati, varices, extended over all the wreaths.  
 Contrarii, anfractus: the wreaths of most shells follow the sun; that is, when a shell is laid upon the mouth with the spire turned from the person viewing it, the wreaths proceed from the left hand towards the right; but there are some shells that turn the contrary way, and are therefore called contrariae or sinistrae.  
 Convoluta, testa, where the exterior wreaths spirally surround the interior, as in all the Coni.  
 Coronati, anfractus, girt towards the apex with a single row of eminences.  
 Corpus, the body of the shell, the last or great wreath.  
 Corticata, testa, covered with an epidermis.  
 Costae, large ridges, drawn from the apex to the periphery.  
 Crispata, testa, rough with waving lines.  
 Cylindrico-umbilicata, testa, whose umbilicus is a cylindrical hole.

## D.

- Decollatus, apex, when the end of the spire appears horizontal; when naturally so it is shut or full, but when by accident the apex is truncated, it has always a cavity.  
 Decussati, varices, striae, crossing, both longitudinal and transverse.  
 Denticulus umbilicalis, the margin of the perforated umbilicus furnished with a sort of dent or tooth.  
 Digitatum, labrum, divided to the base of the interior margin, in diverging attenuated lobes like fingers, as in the *Strombi*.  
 Digiti, the lobes of the labrum shaped like fingers.  
 Disjuncti, anfractus, distant.  
 Dorsum, the back, generally means the upper surface of the body of the shell when laid upon the opening. In the genera of *Patella* and *Haliotis*, the back means the upper convex surface.

Dehiscens,

**Dehiscens**, apertura, the exterior margin distended, as in some of the Coni, where otherwise it generally uses to be linear.

**Depressa**, testa, pressed down as it were, the transverse diameter, exceeding the perpendicular.

**Depressa**, spira, pressed into the first wreath as it were, not exerted. Plate XI. fig. 19.

**Duplicatae**, suturae, doubled, marked as it were with a double elevated stria, connecting the wreaths.

#### E.

**Effusa**, apertura, where the aperture behind is not whole (coarctata) but the lips are separated by a gap, so that water poured in runs out at it.

**Elongata**, cauda, longer than the lowest wreath.

**Emarginata**, basis, testa, notched, with a piece as it were cut out of the margin.

**Epidermis**, the outer coat of the shell, which is found in some species, and falls off of its own accord, without any injury to the surface of the shell.

**Erosum**, labium, hollowed with very small, obtuse and unequal gutters.

**Explanatu**, cauda, the margins dilated.

**Exquisita**, spira, drawn out and much attenuated.

**Exserta**, spira, much attenuated.

**Exumbilicata**, testa, without the hollow umbilicus.

#### F.

**Faux**, what can be seen of the cavity of the shell by looking in at the aperture.

**Fissum**, labrum, cut as it were in two by a linear sinus.

**Fornicatae**, costae, rough with scales, hollow underneath, longitudinally disposed.

**Frondosi**, anfractus, expanding into leaf-like processes.

**Fusiformis**, spindle-shaped, intermediate between the conical and oval.

#### G.

**Geminatae**, suturae, marked with a double elevated stria, connecting the wreaths.

**Genicula**, a contraction of the wreaths, answering to the septimentum within. By means of the genicula, the wreaths appear as if they had no articuli or joints, especially when the genicula are evidently contracted.

#### I.

## I.

Imbricata, testa, unequal by means of rugae or wrinkles parallel to the margin, and lying over one another.

Imperforata, testa, wanting the hollow umbilicus.

Imbricati, anfractus, carinated below, the carina concealing the under future.

Indivisi, anfractus, intire, opposed to bifidi.

Inflatus, venter, tumid, much larger than the other wreaths.

Integrum, labrum, undivided, the opposite of *fissum*.

Interrupta, testa, continued by new accretions or layers.

Involuta, testa, where the exterior lip is turned inwards at the margin; as in all the *Cyprææ*.

## L.

Lamellati, anfractus, girt with transverse membranaceous-like excrescences.

Lineae, Lines, sometimes, as in the *Cones*, mean merely coloured lines; sometimes they signify either raised or hollow striae.

Lineati, anfractus, marked with lines.

Longitudinales, lineae, extending from the base to the apex.

Labium, the internal margin of the aperture. In the *Patella* it is used for the testaceous membrane inserted into the bottom or inside of their internal cavity; and in them it is either *forficale* growing from the apex, or *laterale* from the side of the shell.

Labrum, the exterior margin of the aperture. It is sometimes called the *Labium exterius*.

Lateralis, siphon, running along the margins of the partitions.

## M.

Marginatae, futurae, elevated, having a prominent ridge.

Margo columnaris, the margin of the *Columella* constituting the internal partition of the aperture.

Marginata, testa, the sides forming a thick elevated rim.

Moniliformes, sulci, elevated, and set with close points.

Mucronatum, labrum, ending in a single point.

Mutilatus, apex, the same with *Decollatus*.

## N.

Nebulosa, testa, marked with darker shades like clouds.

## O.

Obsoleti, anfractus, the suture hardly perceptible.

Obovata, testa, elongated and narrower at the base.

Obliquus,



*Obliquus*, siphon, cutting the axis of the wreaths.

*Operculum*, a scale or plate, with which some testaceous animals close the aperture of the shell; it is either in substance like that of the nail, as in the *Unguis odoratus*, or like the substance of a shell, as in the *Umbilicus Veneris*; of the shops, or it is membranaceous, as in the *Helix Pomatia*.

### P.

*Palmatum*, labrum, shaped somewhat like a hand with fingers, (digiti).

*Papillaris*, apex, opposed to *acutus*, where the apex appears like *Perfoliata*, testa, with a horizontal suture, girt with a deflexed a hemisphere.

*Perforatus*, umbilicus, the hole continued to the apex; excavated.

*Pertusa*, puncta, deep pits, as if made with the point of a pin.

*Pervius*, umbilicus, the same with *perforatus*.

margin, as if one shell were laid upon another.

*Plana*, spira, the upper wreaths equal in height, so that the spire seems truncated.

— *columella*, spreading out into a plane lip.

*Plicata*, *columella*, marked with transverse folds, as in almost all the *Volutae*.

*Polythalamia*, testa, internally separated by partitions, as in the *Nautili*.

*Posticum*, labrum, the hinder part of the interior margin of the aperture, which verges towards the cauda.

*Prominula*, spira, standing out beyond the level of the venter.

*Puncta*, dots, points, whether elevated or sunk.

*Punctatae*, striae, set with small elevated points.

### R.

*Radii*, elevated striae, running from the centre to the periphery.

*Radicata*, testa, fixed by the base to another body.

*Reflexa*, apertura, the anterior part of the lip turned back towards the lowest wreath.

*Repanda*, apertura, waving, the lips at the margin waved.

*Resupinata*, apertura, turned upwards.

*Reticulata*, testa, with lines or striae crossing one another like net-work.

*Retusa*, spira, the lower wreaths of the spire pressed in as it were into the body of the shell.

*Retusa-umbilicata*, spira, so pressed into the belly that it seems a cavity rather than an eminence.

*Retusum*, labrum, terminating in an obtuse sinus or gutter.

Rima, umbilicalis, the umbilicus so covered by the folding back of the lip, that the margin of it only appears.

Rostrata, testa, the extremities elongated.

Rostrum, the lips lengthened out and attenuated, pressed back into the belly.

## S.

Scrobiculato-caniculatum, labrum, with varices and cavities impressed in them.

Scrobiculati, anfractus, having hollow gashes scattered over them, ——— varices, marked with cavities at the margins.

Scripti, anfractus, marked with characters resembling letters.

Setaceae, spinae, attenuated like a hog's bristle.

Sinistri, anfractus, the same with *Contrarii*.

Sipho, a cylindrical canal perforating the partitions in polythalamious shells.

Spiralis, columella, with a cauda twisted into a spire.

Spinoso-radiati, anfractus, girt with spines.

Spinae, spines, thorn-like processes.

Stria, a very small line, either raised or sunk.

Striatae, lineae, rough with transverse striae.

Striati, anfractus, marked with very small lines, either raised or sunk.

Spira, the wreaths taken together.

Solutum, labrum, separated from the wreaths by a sinus.

Spiralis, testa, curled up in such a manner, that a line drawn through the middle of the outermost wreath, would divide all the rest into equal parts.

Sub, in composition, means nearly, partially, approaching to.

Sub-consolidatus, umbilicus, the same with sub-obtectus.

Sub-obtectus, umbilicus, when the lip is so reflected over the umbilicus that only the margin of the opening appears.

Sub-marginalis, vertex, placed near the hinder margin.

Subovatus, somewhat ovate.

Subulatae, spinae, nearly linear at the base, and growing gradually more slender toward the point.

Sulcati, anfractus, marked with broad furrows or ridges.

Sulci, furrows or ridges.

Suturae, where the wreaths are connected.

## T.

Testa, antica, that part of the shell which turns towards the spire. In describing shells, the part which constitutes the spire, and which, when the animal is alive, is placed behind

is called the fore-part of the shell, and the part round the aperture, is called the base or hinder part.

**Torulosi**, anfractus, swelling between the genicula.

**Transversales**, lineae, following the course of the wreaths.

**Turrita**, testa, the wreaths gradually assuming the form of an attenuated cone: the length greatly exceeding the breadth.

**Truncata**, cauda, as if cut off transversely.

**Truncata**, columella, the same with *Abrupta*.

**Turbinata**, testa, the venter or body much swollen or inflated; the spire small, and appearing to be drawn out of the bosom of the venter.

#### V.

**Varices**, sutures of the wreaths, transverse and gibbous.

**Varicosi**, *Murices*, with rounded and gross sutures.

**Venter**, the last wreath of the shell; generally larger than the rest.

**Vertex**, in the *Patella*, the top or prominent part situated nearly in the middle. In the *Bullae* it is used for the apex.

#### U.

**Umbilicus**, the base of the columella, seen underneath the shell.

**Umbilicata**, testa, furnished with an Umbilicus. But in the genus *Cypraea*, those are called umbilicated which have their spire sunk as it were in a hollow.

**Unilocularis**, testa, with a single cavity in opposition to *Polythalamia*.

# EXPLANATION OF THE PLATES.

## PLATE VII.

Exemplifying the Orders of Insects.

- Fig. 1. **T**HE *Scarabæus bicornis*. (Coleoptera).  
 2. The *Gryllus Gryllotalpa*. (Hemiptera).  
 3. The female of the *Aphis Rosæ*.  
 4. The same magnified.  
 5. The same in the larva state.  
 6. The caterpillar of the *Papilio Iris*.  
 7. The chrysalis of the same.  
 8. The perfect Insect. *Papilio Iris*. (Lepidoptera).  
*a, b, c*, the primary or upper wings; *a*, the apex of the wing; *b*, the base; *c*, the posterior angle. *a, b*, the exterior margin or costa; *a—c*, the posterior margin; *c—b*, the interior margin; *d—d*, the posterior angle of the secondary or inferior wings, called also the *Angulus ani*.  
 9. The Caterpillar of the *Phalaena Syringaria*, (an example of the *Geometrae*).  
 10. The Pupa of the same,  
 11. The perfect insect. *Phal. Syringaria*.  
 12. The larva of the *Myrmeleon formicarium*.  
 13. The Pupa of the same.  
 14. The case with the skin of the larva remaining in it.  
 15. The perfect Insect. *Myrm. formicarium*. (Neuroptera).  
 16. The larva of the *Sirex Gigas*.  
 17. The pupa of the same.  
 18. The perfect Insect. *Sirex Gigas*. Hymenoptera.  
 19. The larva of the *Oestrus hæmorrhoidalis*. *c*, the hooks.  
 20. The pupa of the same.  
 21. The perfect insect, *Oestr. hæmorrhoidalis*. (Diptera).  
 22. The head of the *Oestrus* magnified. *a*, the antennæ; *b*, the three pores or openings at the mouth; *c, c*, the sides of the mouth-  
 23. The *Scorpio europæus*. (Aptera.)  
 24. The pecten of the *Scorpio* magnified.

PLATE

## PLATE VIII.

## Exemplifying the parts of insects.

- Fig. 1. The head of the *Carabus Sexguttatus*; the fore and upper part. a, the clypeus. b, b, the two outer maxillae. c c c c, the four palpi.
2. The same, seen on the under side. a, the labium; b, b, the two inner maxillae; c c c c, the four palpi.
3. The instrumenta cibaria of the *Gryllus viridissimus*. A, the head somewhat magnified; a, the galea; b, b, the mandibulae; c, c, c, c, the palpi. B, the head with the galea removed; b, b, the outer maxillae; c, c, c, c, the palpi. C, the galea separated. D one of the maxillae. E, the mandibulae, with the two fore palpi; e, the labium; g, g, the two posterior palpi.
4. The head of the *Papilio Menelaus*. a, the spiral tongue; b, b, the antennae clavatae; c, c, the palpi; d, one eye.
5. The *Cimex rufipes*.
6. The head of the same magnified. a, the rostrum; b, b, the filiform antennae.
7. The *Bombylius minor*.
8. The head of the same magnified. a, the proboscis; b, b, b, the three setae; c, c, the palpi; d, d, the antennae; e, e, the eyes; f, the stemmata.
9. The *Musca carnaria*.
10. The head of the same magnified. a, a, the retiform eyes; b, the stemmata.
11. A part of the retiform eyes, much magnified.
12. The *Dyticus marginalis*. a, a, the setaceous antennae; b, b, the palpi; c, c, the cups at the fore feet of the male.
13. One of these cups shewn on the under side, magnified, with the tarsus and claws.
14. The *Aranea Diadema*, of its natural size.
15. The head much magnified. a, the eight eyes; b, the maxillae; c, c, the teeth; d, the hairs.

## PLATE IX.

## Exemplifying the antennae of insects.

Fig. 1. *Ptinus Fur*.

1.\* ——— the filiform antennae, magnified.

2. *Cerambyx*

- Fig. 2. *Cerambyx cardui*.  
 2.\* ——— the setaceous antenna magnified.  
 3. *Sphinx fusiformis*,  
 3.\* ——— the antenna magnified.  
 4. *Hister, quadrimaculatus*.  
 4.\* ——— the clavated antenna magnified.  
 5. *Silpha Vespillo*.  
 5.\* ——— antenna magnified, clavata ; clava perfoliata.  
 6. *Scarabæus fasciatus*.  
 6.\* ——— antenna magnified, clavata ; clava fissili.  
 7. *Gryllus Acrida, nasutus*. The head with the ensiform antennae.  
 8. *Musca plebeia*.  
 8.\* ——— the antenna magnified, filata.  
 9. *Hirpa atra*.  
 9.\* ——— antenna magnified.  
 10. *Nepa cinerea*.  
 10.\* ——— the antenna magnified.  
 11. *Meloe Schaefferi*.  
 11.\* ——— antenna magnified, irregularis.  
 12. *Pimelia mortifaga*.  
 12.\* ——— antenna magnified, moniliform.  
 13. *Chrysomela boleti*.  
 13.\* ——— antenna magnified, moniliform, with cordated articulations.  
 14. *Gryllus cærulefcens*.  
 14.\* ——— antenna magnified.  
 15. *Elater ferrugineus*.  
 15.\* ——— antenna magnified, dentated.  
 16. *Elater germanus*.  
 16.\* ——— antenna magnified, pectinated.  
 17. *Phalæna marmorata*.  
 17.\* ——— antenna magnified, barbata.  
 18. *Culex pipiens*.  
 18.\* ——— antenna magnified, barbata.  
 19. *Conops calcitrans*.  
 19.\* ——— antenna magnified, pilosa, sub-plumata.  
 20. *Monoculus quadricornis*.  
 20.\* ——— antenna magnified.  
 21. *Pauffus*.  
 21.\* ——— antenna magnified, falcata.  
 22. *Tabanus bovinus*.  
 22.\* ——— antenna magnified.  
 23. *Tabanus bromius*.  
 23.\* ——— antenna magnified, lunata.

24. *Musca*

- 24. *Musca intricaria*.
- 24.\* ——— antenna magnified, setaria.
- 25. *Musca pellucens*.
- 25.\* ——— antenna magnified, pilosa plumita.
- 26. *Gyrinus natator*.
- 26.\* ——— antenna magnified,
- 27. *Formica herculanea*.
- 27.\* ——— antenna magnified.

## PLATE X.

## Exemplifying the Characters of Bivalve shells.

Fig. 1. *Chiton aculeatus*. Shell with eight valves. a, a, the valves longitudinally arranged, incumbent on the back; b, b, the rounded sides; c, c, the limbus of the animal. Note. This situation of the valves is peculiar to the Chiton.

2. *Lepas anatifera*. Shell compressed, striated, five valved; a, the larger valves, nearly quadrangular, meeting before, transversely cut at the base; b, the lesser valves nearly triangular, occupying the apex of the shell; c, the solitary valve, rounded, acute; d, the extended arms; e, the scaly intestine, open at f, to shew it to be hollow.

3. *Pholas Dactylus*. Shell bivalve; a, a, a, the three subsidiary valves placed at the hinge; b, b, the upper extremity attenuated, dotted like net-work. c, c, the inferior, somewhat obtuse, transversely striated. The valves remote from each other. Note. These circumstances form the generic character of the Pholas.

Note. Sections only are given of the following shells; Fig. 4, 6, 7, 8, 9, 10, 12 A, to shew the parts adjoining to the hinge in which are the teeth.

4. *Ostrea Pallium*. a, the cavity of the hinge, oval; b, the superior ear, intire; c, the inferior ear produced, cut or dissected, somewhat dentated below the base, d.

5. *Donax scriptus*. A, the right valve. B, the left valve; a, the two principal teeth compressed; b, the tooth on the posterior side, oblong, solitary, separated from the primary teeth by a cavity; c, the crenulated margin; d, the posterior region.

6. *Mya pistorum*. a, a, the primary tooth solid, thick, forming a gap, empty; b, the lateral tooth, longitudinal,

dinal, and standing next the anterior region, in the left valve; c, c, a double tooth; d, d, the nates or umbones; e, e, the anterior region; f, f, the posterior region.

7. *Selen. strigilatus*. The left valve. a, the tooth subulated, reflexed, often double, empty, the lateral margin obsolete. A single tooth in the left valve, two in the right, whence there proceeds the margin b, under the anterior region.
8. *Tellina Remies*. A, the left valve. B, the right valve. The teeth a, a, primary, standing out, remote; b, b, the single posterior tooth, following the course of the hinge; c, c, the tooth next the anterior region, somewhat remote; both oblong, separated by a cavity, the cartilages obtuse, of the length of the anterior margins d, d; e, e, the posterior region dentated.
9. *Cordium*. a, a, the middle teeth, (primary) two, and alternate (one corresponding to the cavity of the other), separated by a deep hollow, the lateral ones remote; b, b, a single tooth under the posterior region, and another, c, c, under the anterior. *Cordium aculeatum*. A, the left valve, B, the right. e, e, the umbones, prominent, inflexed, striated crosswise. Note. In this specimen the posterior teeth were somewhat divided into two.
10. *Mastra*. Gen. Char. a, a, the primary tooth complicated, a hollow in the middle; b, b, the lateral teeth remote, inserted. *Mastra stultorum*. A, the left valve, B, the right; the teeth standing out, compressed, membranaceous; c, c, the anterior region, gibbous; d, d, the umbones, reflexed; e, e, the posterior region.
11. *Venus*. Gen. Char. a, a, the primary teeth; three in the left, and two in the right valve, all close together; b, b, the lateral teeth diverging from the apex; the anus and vulva distinct. *Venus Digne*. A the left, and B the right valve; the valves semicordated, and equal; c, c, the umbones recurved, obtuse; d, d, the posterior region depressed; e, e, the cartilages; an arched cavity under the umbones.
12. *Chama Gigas*. A the right, B the left valve; a, a, the primary teeth; b, b, the retuse posterior region; c, c, the anterior region; B, the plaited valve; d, d, five strong plaits, arched, and extending beyond the limb.



- Fig. 13. *Anomia*.** Generic Char. Shell unequal; one valve somewhat flat, the other gibbous at the base; the flat one *a*. generally perforated at the base. The hinge without teeth. A lateral tooth prominent, fixed to the margin of the flat valve, but somewhat extended to the hinge of the convex one. *Anomia Cepa*. Shell oval, the valve *b*. plane and perforated. Through this opening proceeds the tendon by which the shell is attached to other bodies.
14. *Spondylus Gaderopus*. Gen. Char. Teeth of the hinge; *a*, *a*, two, incurved, with a hollow between them. Three fossulae, one intermediate, the rest placed at the sides of the teeth; *b*, the umbones as if unequally cut off with a knife.
15. *Arca*. Gen. Char. *a*, *a*, teeth numerous, alternate, acute, inserted; *b*. the nates prominent, recurved; *c*. *c*. the margin crenated.
16. *Venus Dione*. View of the hinder parts; *a*, *a*, the anterior region oval and obliquely striated; fringed with *b*, *b*, subulated spines, curved forwards, the upper ones longest, descending from the extremity of the anterior side to *c*, *c*, the umbo; *d*, *d*, the margins armed with small spines; *f*, *f*, the umbones reflexed, approximated, transversely falcated; *g*. the posterior depression oval and striated.
17. *Venus Dione*. Side view of the left valve; *a*, the anterior region; *b*, *b*, the spines; *c*, the umbo; *d*, *e*, the disc; *f*, *f*, *f*, the limb; *g*, *h*, the anterior margin; *b*, *i*, the inferior margin; *i*, *k*, the posterior margin; *k*, *g*, the superior margin.
18. *Cardium pectinatum*. Shell semi-cordate; *a*, pectinated; *b*, the umbo; *c*, the posterior region; *d*, the anterior region; the whole margin crenated.
19. *Cardium echinatum*. *a*, the anterior region; *b*, the posterior region; *c*, the umbo; *d*, the disc; the valve with regular ridges and furrows; the ridges set with subulated spines reversed; the margin deeply crenated.
20. *Chama Gigas*. Shell plaited, longitudinally striated between the folds; *a*, *a*, the folds set with semi-circular, arched, ascending scales; *b*, *b*, the margin waved.
21. *Anomia craniolaris*. The valves conical; the inside furnished with two round eminences, *a*, *a*, making

impressions on the other valve; b, the hinge, transversely truncated.

Fig. 22. *Arca barbata*. a, the rounded apex, striated, covered with a beard; b, the nates.

23. The animal inhabiting the Anomia; a, the body, having an emarginated ciliated ligament; b, b, two arms, linear, approaching, longer than the body, and ciliated.

## PLATE XI. COCHLEAE.

Fig. 1. *Helix lusitanica*. Shell globose, with a perforated umbilicus; a. the umbilicus; b. b. b. the rounded venter; c. the closed, semi-lunar shaped aperture. Note. This form of the aperture constitutes the essential generic character of the *Helix*, though some of the genus have an aperture nearly oval.

2. *Turbo bidens*. Shell conical; a. a. the venter; b. b. the wreaths turning the contrary way; c. the pointed spire; d. d. the sutures; e. the hollow lip. Example of a dentated sub-orbicular aperture.

3. *Helix decollata*. Shell imperforated, oblong, conical; a. the wreaths imbricated upwards, cylindrical; b. the spire with the point blunt; c. the aperture oval.

4. *Helix auricularia*. Shell oval, obtuse; a. the inflated venter; b. the spire acute and very short; c. the outer lip, dilated and rounded; d. the single fold of the lip; the aperture large.

5. *Patella equestris*. Shell circular; a the concavity; b. b. b. the crenated margin; c. the arched perpendicular lip.

6. *Patella saccharina*. Shell angulated; a. a. seven ridged acute costae; b. the obtuse vertex.

7. *Turbo scalaris*. Shell conical; a. a. the cancellated wreaths; b. b. the membranaceous cingula, obliquely perpendicular and distant; c. the spire acute, papillary; d. the aperture circular; e. e. the lip reflexed. Note. This species affords an excellent example of the round aperture, which is the generic character of the *Turbo*.

Fig. 8. *Argonauta Argo*. Shell spiral; a. a. the venter compressed and as it were plaited; b. b. the dentated carina.

9. *Bulla ampullacea*. Shell oval; a. the back, without a spire, but the vertex b. umbilicated.

10. *Cypræa Lynx*. Shell involuted, oblong, and spotted; a. a. the lips turned in with equal transverse dents; b. the aperture linear, with a gap (effusa), longitudinal. Note. This sort of aperture is peculiar to the genus *Cypræa*.

11. *Cypræa Moneta*. Shell depressed; a. a. with a knobbed margin. (See fig. 13) b. the back gibbous; c. the anterior part, and d. the posterior part of the shell; e. e. two prominences instead of a spire.

12. *Cypræa Globulus*. Shell globose, with a beak at each end; a. b. the elongated extremities; a. the anterior, longer than b. the posterior; c. the back.

13. *Cypræa caurica*. Shell marginated, clouded; a. a. a. the gibbous margin; b. the anterior extremity somewhat produced.

14. *Buccinum Harpa*. Shell oval; a. the dilated venter, with the upper margin attenuated; b. b. b. the varices which are longitudinal, equal, distinct, and topped with sharp spines, c. c.; d. the short pointed spire; e. e. the inferior dilated ribbed wreaths; f. the cauda, exerted, channelled, retuse on the outer side, proceeding towards the back. Note. This direction of the cauda affords the principal character of the genus *Buccinum*.

15. *Murex Tribulus*. Shell oval; a. a. the base of the venter; b. b. the futures, agglutinated, incrassated; c. c. the spire attenuated, acuminate, the wreaths set transversely with spines; d. d. the spines, long, setaceous, curved, and scattered over the whole shell; e. the cauda, elongated, straight, and close; f. f. the outer lip dilated; g. the lip plain and dilated; h. h. the columella retuse; i. the rudiment of an umbilicus; the aperture oval, ending in the gutter of the cauda. Note. The character of the *Murex* is taken from the straight cauda.

16. *Nautilus Beccarii*. A section. Shell spiral and compressed; the wreaths contiguous, and torulose; a. a. a. the genicula; b. b. b. the torulose articulations; c. c. c. the partitions; d. d. the lateral siphon. Note. The partitions always correspond to the genicula

nicula; when the shell is divided by partitions which are perforated by a siphon, it belongs to the genus *Nautilus*.

Fig. 17. *Voluta Musica*. Shell fusiform; a. the venter marked with stripes and interrupted lines; b. the base e-marginated; c. c. the wreaths topp'd at the sutures with obtuse spines; the spire exerted, crenated; d. d. the columella plaited; e. e. the outer lip smooth, thick, and free; the lip convex, spread out, and ending in the columella.

18. *Murex reticularis*. Shell reticulated; a. a. the back with raised spots; b. b. the varices opposite, continued, tuberculated; e. the spire acuminate; the wreaths set with round tubercles; d. the cauda exerted, short, ascending; e. emarginated.

19. *Murex Ricinus*. Shell without a cauda; a. the venter set thick with spines; b. b. b. spines subulated; c. the spire depressed; d. the outer lip dentated, with double teeth sinuated at the margin; e. the lip somewhat plane; f. the columella dentated; the aperture and faux patent.

20. *Trochus maculatus*. Shell conical; a. the base full of small papillae; b. b. the wreaths set with granular warts, imbricated, contiguous; the venter ridged below; c. the outer lip somewhat lobated, below separated from the lip by a sinus d.; e. the columella twisted with an oblique umbilicus; f. the aperture angulated and four-cornered. Note. The *Trochus* is best distinguished from other shells by this sort of opening.

21. *Strombus Pes Pelicani*. Shell oblong; a. a. the lower wreaths with double cingula ending in b. the carina of the outer lip; c. c. the upper wreaths surrounded with single cingula striated; the spire tapering, long; d. d. d. d. the palmated outer lip with four digits, spreading, angulated, acute, the first and last connected; the caudal digitus serrated and turning towards the left. Note. On account of this direction of the cauda, this shell is ranked with the *Strombi*.

22. *Helix citrina*. Shell orbicular; a. a. the base convex; b. the outer lip marginated; the aperture lunated; c. the umbilicus, cylindrical, nearly covered with a scale proceeding from the outer lip.

23. *Nerita Carrena*. a. the umbilicus gibbous, bifid, deep, arched

arched behind; b. b. the outer lip dilated, arched, obtuse, intire; c. c. the lip of the columella, transverse, hollowed in the middle, and truncated. The aperture gaping, without teeth. Note. This figure and extension of the lip constitutes the principal character of the genus.

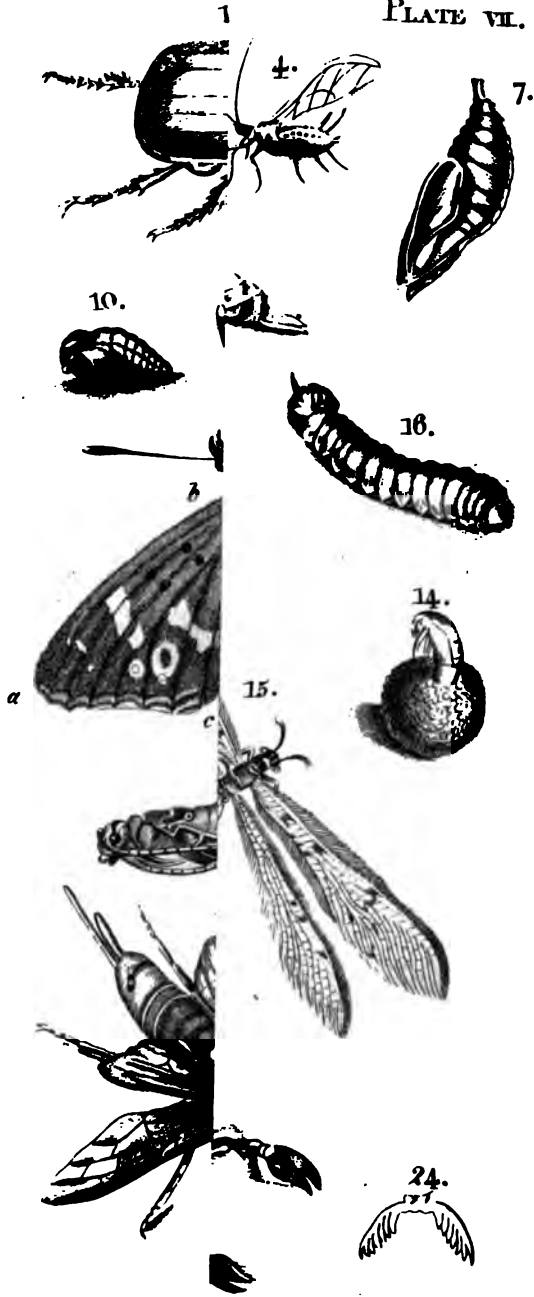
- Fig. 24. *Haliotis varia*. Shell oval, ribbed; a. a. the ribs acute and striated cross-wise; b. the lateral spire with its margin dentated.
25. *Haliotis parva*. Shell oval, ear-shaped, decussated; a. the back of the venter, with an elevated angle, surrounded with a row of holes occupying the disc; b. the spire, hidden, lateral.
26. *Murex saxatilis*. Shell contiguous, frondose; a. a. a. the frondes; b. the venter rough with lines, the spire contiguous; c. the outer lip sinuated, the columella retuse, continued into a reflexed lip; d. d. the cauda abbreviated, close, straight, the aperture oval.
27. *Trochus Telescopium*. Shell imperforated, conical, deeply striated transversely; the wreaths undivided; a. the base; b. the columella standing out and spiral; c. the outer lip dilated, grooved below with a single fold, growing to the columella; the lip intire hid in the faux, the aperture tetragonal.
28. *Murex Vertagus*. Shell torrited; a. a. the venter and the wreaths folded on the upper side; b. the ascending cauda; c. the columella plaited; d. the outer lip dilated and retuse behind.
29. *Strombus Scorpio*. The shell oblong, turbinated; a, a, a, the back girt with three knobby cingula and waving striæ; b, the spire conical, and shorter than the lip on which it rests; c, c, the elevated sutures; d, d, the waving margin of the lip, putting out seven digits; e, the caudal digitus, bent towards the left; f, f, the lateral digits all pointing forwards, knotty; g, g, the knots opposite, lateral, and dorsal.
30. *Strombus Fissurella*. The wreaths reticulated, with rigid ribs; b, the outer lip closed, continued into c, c, a cleft longitudinal carina revolving round the apex of the spire; d, the short cauda; the outer lip somewhat free.

## PLATE XII.

- Fig. 1. The *Amphitrite auricoma*, Mull. *Sabella granulata*, Lin. out of the tube. b. b. the lateral filaments; c. c. the jaws, in the midst of which are the tentacula; d. d. the feet.
2. The same animal within the tube.
3. The *Lepas anatifera*. a. the rostrum; b. the palpi; c. the pedicle; d. the shells.
4. The *Hydra viridis*. The green polypus.
5. The same magnified; a. the body; b. b. two young Polypi shooting like buds; c. the head, where the mouth lies; d. d. the tentacula or arms.
6. The *Buccinum undatum*. a. a. the tentacula; b. b. the eyes; c. the place of the mouth; d. the foot; e. the rostrum; f. the operculum; g. the apex of the shell; h. the wreaths; i. the base of the shell; k. the outer lip; l. the futures; m. the venter.
7. The *Millepora truncata*.
8. The animal of the *Cardium ecbinatum*. a. the falcated red foot; b. b. the gills; c. the siphon with its fibres; d. the pallium which furrounds the whole body, and by which the animal lets in or shuts out the water.
9. The *Madrepora lacera*. Pall.
10. The *Sertularia pumila*, running upon the leaf of a fungus.
11. The same magnified; a. the denticles; b. a cell with the animal appearing out of it.
12. The *Volvox globator*.
13. The same magnified; b. the young.
14. The *Lucernaria quadricornis*. Mull.
15. The *Trichoda Cometa*.
16. The *Cellepora pumicosa*.
17. The same magnified.

INDEX.

PLATE VII.







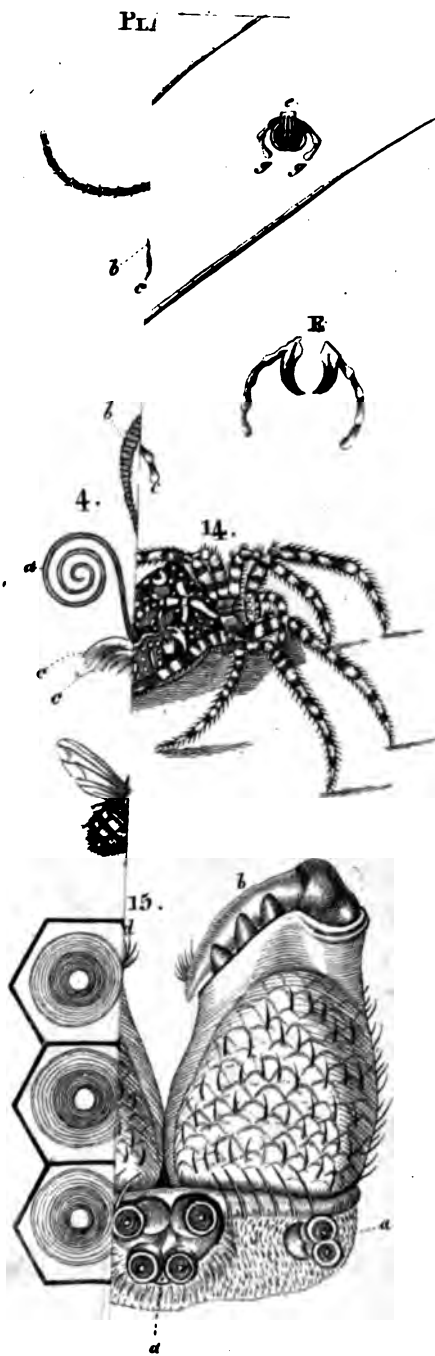
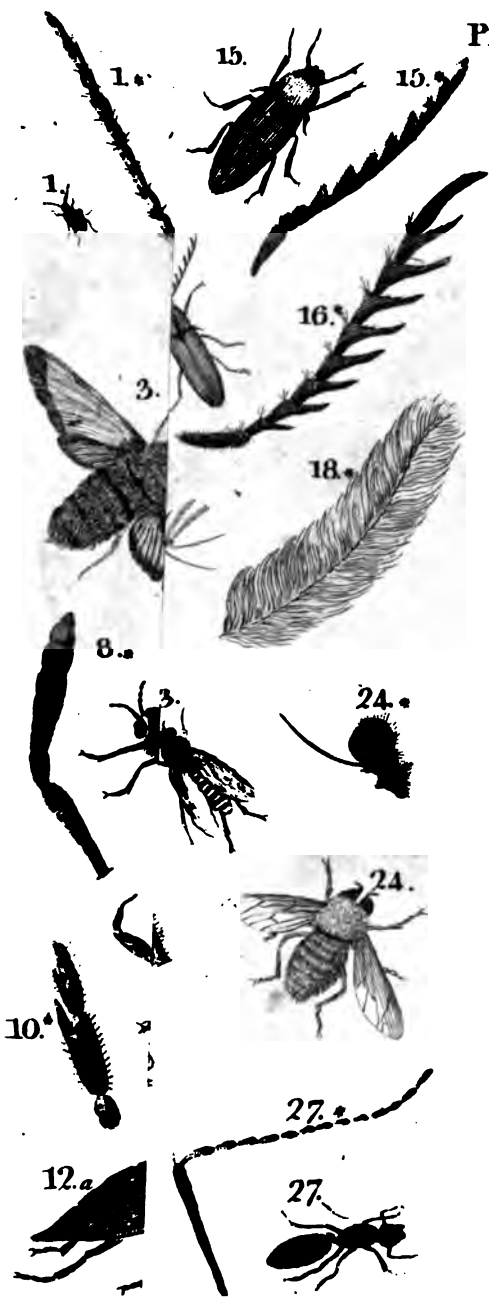


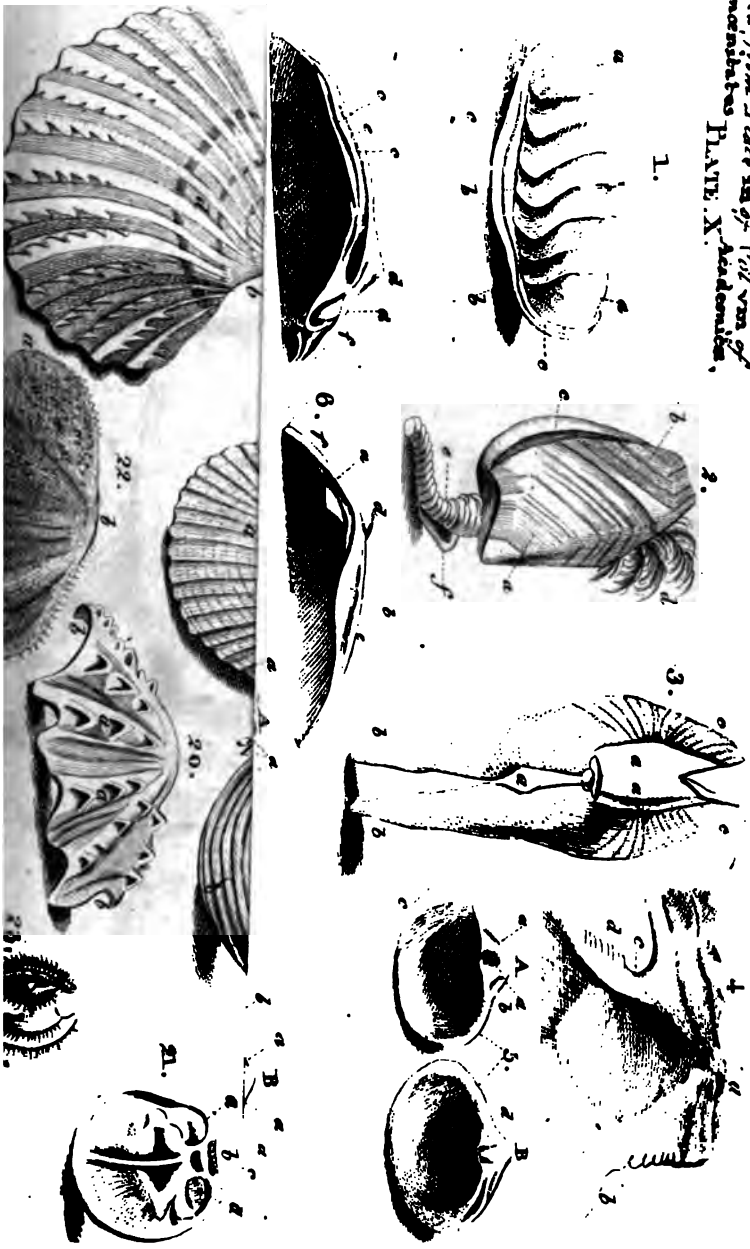


PLATE IX.





*Obvied from Plate 22 of Vol. 10 of  
*Amorinatus* PLATE X.*





Copied from Plate II of Vol. VIII of *Anacanthites Academicæ*, b

6 PLATE II

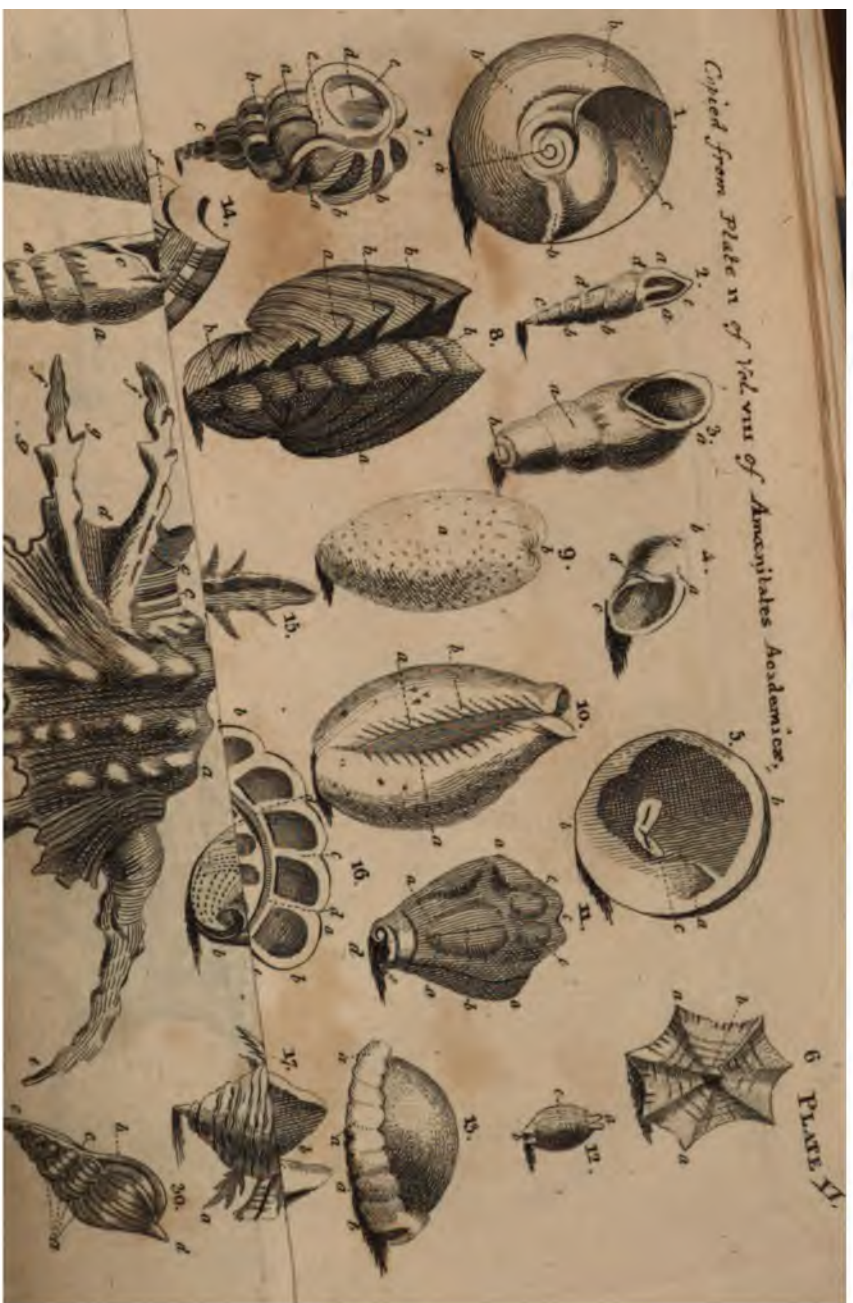






PLATE XII





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# I N D E X.

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**Cerambyx**

Cerambyx	-	63	Dermestes	-	31
Cercaria	-	439	Dioplis	-	254
Chama	-	373	Dipper	-	386
Chalcis	-	236	Donax	-	369
Chermes	-	111	Doris	-	336
Chiton	-	355	Dragon-fly	-	207
Chrysis	-	236	Dytiscus	-	77
Chrysomela	-	45			
Cicada	-	96	E.		
Cicindela	-	73			
Cimex	-	100	Ear-shell	-	403
Clava	-	342	Echinorhynchus	-	311
Clio	-	346	Echinus	-	330
Coccinella	-	42	Elater	-	71
Cockchafer	-	28	Empis	-	269
Cockle	-	366	Enchelis	-	442
Coccus	-	112	Ephemera	-	210
Colpoda	-	440	Erodium	-	85
Conops	-	271			
Conus	-	384	F.		
Corallina	-	423			
Coralline, common	-	424	Filaria	-	320
Cowry	-	385	Flea	-	282
— small	-	386	Flustra	-	410
Crab, common	-	297	Fly, common house	-	258
— Land	-	296	— flesh	-	—
Craw-fish	-	299	— horse	-	267
Cricket, common	-	93	Forficula	-	89
— Mole	-	—	Formica	-	244
Cryptocephalus	-	50	Fulgora	-	95
Cuckoo-spit insect	-	97	Furia	-	329
Cuenjus	-	68			
Cucullanus	-	323	G.		
Culex	-	268			
Curculio	-	54	Gad-fly	-	147
Cuttle-fish	-	346	Glow-worm	-	68
Cyclidium	-	440	Gnat	-	268
Cynips	-	219	Gonium	-	440
Cypræa	-	385	Gordius	-	330
			Gorgonia	-	415
D.			Grass-hopper	-	95
Dagya	-	341	Gryllus	-	92
Dentalium	-	408	Gyrinus	-	35
					H.



INDEX.			489
	H.	Lucanus -	30
		Lucernaria -	347
<b>Haeruca</b>	-	Lumbricus -	330 -
<b>Haliotis</b>	-	Lytta -	85
<b>Hawkmoth</b>	-		
<b>Helix</b>	-	M.	
<b>Hemerobius</b>	-		
<b>Hippobosca</b>	-	Macrocephalus	108
<b>Hirudo</b>	-	Mastra -	367
<b>Hister</b>	-	Madrepora -	412
<b>Hispa</b>	-	Mammaria -	343
<b>Holothuria</b>	-	Manticora -	84
<b>Horia</b>	-	Mantis -	91
<b>Hornet</b>	-	May-fly -	211
<b>Humble-bee</b>	-	Meal-worm -	83
<b>Hydra</b>	-	Medusa -	347
<b>Hydrachna</b>	-	Meloe -	85
<b>Hydrophilus</b>	-	Melyris -	33
		Midge -	269
	I.	Millepora -	413
		Mite -	284
<b>Ichneumon</b>	-	Monas -	442
<b>Jigger</b>	-	Monoculus -	302
<b>Ifis</b>	-	Mordella -	86
<b>Julus</b>	-	Moth -	140
		Murex -	391
	L.	Muscle -	379
		Painter's -	359
<b>Lady Cow</b>	-	Musca -	254
<b>Lampyrus</b>	-	Musquetoe -	268
<b>Leech</b>	-	Mutilla -	246
<b>Lepas</b>	-	Mya -	358
<b>Lepisma</b>	-	Myrmeleon -	217
<b>Leptura</b>	-	Mytilus -	379
<b>Lernæa</b>	-	Myxine -	329
<b>Leucophra</b>	-		
<b>Leucospis</b>	-	N.	
<b>Libellula</b>	-	Nais -	339
<b>Ligula</b>	-	Nautilus -	384
<b>Limax</b>	-	Paper -	
<b>Limpet</b>	-	Necydalis -	67
<b>Linguatula</b>	-	Nepa -	99
<b>Lobaria</b>	-	Nereis -	339
<b>Lobster</b>	-	Nerita -	404
<b>Louse</b>	-	Nitidula -	20
VOL. II.		Q q q	Notes

Notonecta	-	99	Salpa	-	341
Notoxus	-	62	Scarabæus	-	21
	O.		Scaurus	-	84
			Scolex	-	311
			Scolia	-	234
Oestrus	-	247	Scolopendra	-	305
Oniscus	-	304	Scorpion	-	293
Opatrum	-	40	Scorpion-fly	-	217
Ostrea	-	375	Seyllæa	-	345
Oyster	-	375	Sepia	-	346
Thorny	-	373	Serropalpus	-	71
	P.		Sea Egg	-	350
			Urchin	-	-
			Serpula	-	408
Panorpa	-	217	Sertularia	-	425
Papilio	-	117	Silpha	-	37
Paramecium	-	440	Sipunculus	-	332
Patella	-	405	Sirex	-	224
Pausus	-	53	Sleeve-fish	-	347
Pedicellaria	-	343	Slug	-	334
Pediculus	-	278	Snail	-	334
Pennatula	-	433	Shelled	-	398
Phalangium	-	287	Solen	-	360
Phalæna	-	140	Sphex	-	232
Phryganea	-	212	Sphinx	-	134
Phytophora	-	348	Spider	-	289
Pimelia	-	83	Spio	-	338
Pinna	-	381	Spondylus	-	373
Pismire	-	246	Spongia	-	418
Planaria	-	331	Staphylinus	-	87
Pneumora	-	91	Star-fish	-	348
Podura	-	276	Stomoxys	-	270
Polypus	-	435	Strombus	-	390
Pterotrachea	-	344	Strongylus	-	321
Ptinus	-	33		T.	
Pulex	-	282			
	R.		Tabanus	-	266
			Tænia	-	326
Raphidia	-	218	Tellina	-	362
Razor-shell	-	360	Tenebrio	-	82
Rhinomacer	-	61	Tenthredo	-	221
	S.		Terebella	-	338
			Teredo	-	409
			Termes	-	277
Sabella	-	410		Tethys	



# INDEX.

<b>Tethys</b>	.	.	343	<b>V.</b>	
<b>Thrips</b>	.	.	114		
<b>Thynnus</b>	.	.	234	<b>Venus</b>	- - 370
<b>Tick</b>	.	.	283	<b>Vespa</b>	- - 237
<b>Tiphia</b>	.	.	235	<b>Vibrio</b>	- - 441
<b>Tipula</b>	.	.	249	<b>Uncinaria</b>	- - 320
<b>Tooth-bell</b>	.	.	408	<b>Volvox</b>	. . 442
<b>Trichocephalus</b>	-	-	319	<b>Voluta</b>	. . 387
<b>Triton</b>	-	-	344	<b>Vorticella</b>	. . 438
<b>Trichoda</b>	.	-	439	<b>Wasp</b>	. . 237
<b>Tritoma</b>	-	-	40	<b>Weevil</b>	. . 55
<b>Trochus</b>	-	.	393		
<b>Tubipora</b>	.	.	412	<b>Z.</b>	
<b>Tubularia</b>	.	.	422	<b>Zonitis</b>	. . 53
<b>Turbo</b>	.	.	395	<b>Zygia</b>	. . 53



## ERRATA.

- Page 4, line 33, for fig. 5. a. read fig. 6. a.  
 5, line 32, for 9. f. read 10. b.  
 8, line 19, read club-shaped, (*clavatum*), as in the  
 Spheg; fickle shaped, (*falcatum*).  
 48. The character of the second section should have been  
 in page 49, immediately above *Chryfomela oleracea*.  
 91, 93, 95, make the head line Hemiptera.  
 76, line 27, for actually, read apparently.  
 110, Species 16, for Tibiæ, read Tiliæ.  
 163, line 18, for It is, read Is it.  
 292, line 21, *Erase the B.*  
 292, line 36, *Erase the B.*  
 295, line 9, for obicular, read orbicular.  
 311, line 1, read CHERMES.  
 444, lines 14 and 16, read Aculeato.







